

1/236

SEQUENCE LISTING

<110> Neo-Morgan Laboratories Inc.
FURUSAWA, Mitsuru

<120> Method and system for rapidly conferring a desired trait to an organism

<130> NEO001PCT

<150> JP 2003-92898

<150> 2003-3-28

<150> US 10/684, 141

<151> 2003-10-10

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<170> PatentIn Ver. 2.1

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2/236

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3/236

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4/236

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5/236

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6/236

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7/236

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695

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765

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795

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815

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865

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880

8/236

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9/236

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10/236

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11/236

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12/236

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gaaatagagg aaaaggaaaa tcaggattat accgctgttt cgcaatggca actaaagaag 6420
ttctgtcac caatatatca gcccgattt gaggattgga tgatgatcat attggatagt 6480
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tctcaccttt ttccaaacc actaatgaaa agagtcaaaa agctttttaa aaaccagcaa 6660
gagttcattt tagatcctca gtatgaggca gactatgtta ttctgttct tcctggttcc 6720
catctgaatg tgaaaaatcc cttctagaa cttgtcaaat cactctgcca tgtcatgtta 6780
ctttcaaaga gtacaatttt agaaatcagg accctgagaa aagaactgct gaagatattt 6840
gaattgcgtg agtttgctaa agtagcggaa ttcaaagatc caagtttgag tctcgtggtg 6900
ccggattttt tatgtgaata ctgttttttc atttctgata ttgacttttg taaggcagct 6960
cctgaatcta ttttttcattg cgtcagatgt cacaaagcct ttaatcaagt attgttgcaa 7020
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tgctccagat gtcataaagt gaaacgtgac tatatgagtg ccactgttcc atgtgccggc 7140
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accgaaaaat tagcccttga acataattaa cactcttctt tgatatttaa atcacaagta 7440
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<210> 4

<211> 2222

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 4

Met Met Phe Gly Lys Lys Lys Asn Asn Gly Gly Ser Ser Thr Ala Arg

13/236

1	5	10	15
Tyr Ser Ala Gly Asn Lys Tyr Asn Thr Leu Ser Asn Asn Tyr Ala Leu			
20	25	30	
Ser Ala Gln Gln Leu Leu Asn Ala Ser Lys Ile Asp Asp Ile Asp Ser			
35	40	45	
Met Met Gly Phe Glu Arg Tyr Val Pro Pro Gln Tyr Asn Gly Arg Phe			
50	55	60	
Asp Ala Lys Asp Ile Asp Gln Ile Pro Gly Arg Val Gly Trp Leu Thr			
65	70	75	80
Asn Met His Ala Thr Leu Val Ser Gln Glu Thr Leu Ser Ser Gly Ser			
85	90	95	
Asn Gly Gly Gly Asn Ser Asn Asp Gly Glu Arg Val Thr Thr Asn Gln			
100	105	110	
Gly Ile Ser Gly Val Asp Phe Tyr Phe Leu Asp Glu Glu Gly Gly Ser			
115	120	125	
Phe Lys Ser Thr Val Val Tyr Asp Pro Tyr Phe Phe Ile Ala Cys Asn			
130	135	140	
Asp Glu Ser Arg Val Asn Asp Val Glu Glu Leu Val Lys Lys Tyr Leu			
145	150	155	160
Glu Ser Cys Leu Lys Ser Leu Gln Ile Ile Arg Lys Glu Asp Leu Thr			
165	170	175	
Met Asp Asn His Leu Leu Gly Leu Gln Lys Thr Leu Ile Lys Leu Ser			
180	185	190	
Phe Val Asn Ser Asn Gln Leu Phe Glu Ala Arg Lys Leu Leu Arg Pro			
195	200	205	

14/236

Ile Leu Gln Asp Asn Ala Asn Asn Asn Val Gln Arg Asn Ile Tyr Asn

210

215

220

Val Ala Ala Asn Gly Ser Glu Lys Val Asp Ala Lys His Leu Ile Glu

225

230

235

240

Asp Ile Arg Glu Tyr Asp Val Pro Tyr His Val Arg Val Ser Ile Asp

245

250

255

Lys Asp Ile Arg Val Gly Lys Trp Tyr Lys Val Thr Gln Gln Gly Phe

260

265

270

Ile Glu Asp Thr Arg Lys Ile Ala Phe Ala Asp Pro Val Val Met Ala

275

280

285

Phe Asp Ile Glu Thr Thr Lys Pro Pro Leu Lys Phe Pro Asp Ser Ala

290

295

300

Val Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Glu Gly Phe

305

310

315

320

Leu Ile Thr Asn Arg Glu Ile Ile Ser Glu Asp Ile Glu Asp Phe Glu

325

330

335

Tyr Thr Pro Lys Pro Glu Tyr Pro Gly Phe Phe Thr Ile Phe Asn Glu

340

345

350

Asn Asp Glu Val Ala Leu Leu Gln Arg Phe Phe Glu His Ile Arg Asp

355

360

365

Val Arg Pro Thr Val Ile Ser Thr Phe Asn Gly Asp Phe Phe Asp Trp

370

375

380

Pro Phe Ile His Asn Arg Ser Lys Ile His Gly Leu Asp Met Phe Asp

385

390

395

400

15/236

Glu Ile Gly Phe Ala Pro Asp Ala Glu Gly Glu Tyr Lys Ser Ser Tyr
405 410 415

Cys Ser His Met Asp Cys Phe Arg Trp Val Lys Arg Asp Ser Tyr Leu
420 425 430

Pro Gln Gly Ser Gln Gly Leu Lys Ala Val Thr Gln Ser Lys Leu Gly
435 440 445

Tyr Asn Pro Ile Glu Leu Asp Pro Glu Leu Met Thr Pro Tyr Ala Phe
450 455 460

Glu Lys Pro Gln His Leu Ser Glu Tyr Ser Val Ser Asp Ala Val Ala
465 470 475 480

Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ser Leu
485 490 495

Cys Thr Ile Ile Pro Leu Asn Pro Asp Glu Thr Leu Arg Lys Gly Thr
500 505 510

Gly Thr Leu Cys Glu Met Leu Leu Met Val Gln Ala Tyr Gln His Asn
515 520 525

Ile Leu Leu Pro Asn Lys His Thr Asp Pro Ile Glu Arg Phe Tyr Asp
530 535 540

Gly His Leu Leu Glu Ser Glu Thr Tyr Val Gly Gly His Val Glu Ser
545 550 555 560

Leu Glu Ala Gly Val Phe Arg Ser Asp Leu Lys Asn Glu Phe Lys Ile
565 570 575

Asp Pro Ser Ala Ile Asp Glu Leu Leu Gln Glu Leu Pro Glu Ala Leu
580 585 590

Lys Phe Ser Val Glu Val Glu Asn Lys Ser Ser Val Asp Lys Val Thr

16/236

595	600	605
Asn Phe Glu Glu Ile Lys Asn Gln Ile Thr Gln Lys Leu Leu Glu Leu		
610	615	620
Lys Glu Asn Asn Ile Arg Asn Glu Leu Pro Leu Ile Tyr His Val Asp		
625	630	635 640
Val Ala Ser Met Tyr Pro Asn Ile Met Thr Thr Asn Arg Leu Gln Pro		
645	650	655
Asp Ser Ile Lys Ala Glu Arg Asp Cys Ala Ser Cys Asp Phe Asn Arg		
660	665	670
Pro Gly Lys Thr Cys Ala Arg Lys Leu Lys Trp Ala Trp Arg Gly Glu		
675	680	685
Phe Phe Pro Ser Lys Met Asp Glu Tyr Asn Met Ile Lys Arg Ala Leu		
690	695	700
Gln Asn Glu Thr Phe Pro Asn Lys Asn Lys Phe Ser Lys Lys Lys Val		
705	710	715 720
Leu Thr Phe Asp Glu Leu Ser Tyr Ala Asp Gln Val Ile His Ile Lys		
725	730	735
Lys Arg Leu Thr Glu Tyr Ser Arg Lys Val Tyr His Arg Val Lys Val		
740	745	750
Ser Glu Ile Val Glu Arg Glu Ala Ile Val Cys Gln Arg Glu Asn Pro		
755	760	765
Phe Tyr Val Asp Thr Val Lys Ser Phe Arg Asp Arg Arg Tyr Glu Phe		
770	775	780
Lys Gly Leu Ala Lys Thr Trp Lys Gly Asn Leu Ser Lys Ile Asp Pro		
785	790	795 800

17/236

Ser Asp Lys His Ala Arg Asp Glu Ala Lys Lys Met Ile Val Leu Tyr

805

810

815

Asp Ser Leu Gln Leu Ala His Lys Val Ile Leu Asn Ser Phe Tyr Gly

820

825

830

Tyr Val Met Arg Lys Gly Ser Arg Trp Tyr Ser Met Glu Met Ala Gly

835

840

845

Ile Thr Cys Leu Thr Gly Ala Thr Ile Ile Gln Met Ala Arg Ala Leu

850

855

860

Val Glu Arg Val Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp

865

870

875

880

Cys Ile Leu Pro Lys Ser Phe Pro Glu Thr Tyr Phe Phe Thr Leu Glu

885

890

895

Asn Gly Lys Lys Leu Tyr Leu Ser Tyr Pro Cys Ser Met Leu Asn Tyr

900

905

910

Arg Val His Gln Lys Phe Thr Asn His Gln Tyr Gln Glu Leu Lys Asp

915

920

925

Pro Leu Asn Tyr Ile Tyr Glu Thr His Ser Glu Asn Thr Ile Phe Phe

930

935

940

Glu Val Asp Gly Pro Tyr Lys Ala Met Ile Leu Pro Ser Ser Lys Glu

945

950

955

960

Glu Gly Lys Gly Ile Lys Lys Arg Tyr Ala Val Phe Asn Glu Asp Gly

965

970

975

Ser Leu Ala Glu Leu Lys Gly Phe Glu Leu Lys Arg Arg Gly Glu Leu

980

985

990

18/236

Gln Leu Ile Lys Asn Phe Gln Ser Asp Ile Phe Lys Val Phe Leu Glu
995 1000 1005

Gly Asp Thr Leu Glu Gly Cys Tyr Ser Ala Val Ala Ser Val Cys Asn
1010 1015 1020

Arg Trp Leu Asp Val Leu Asp Ser His Gly Leu Met Leu Glu Asp Glu
1025 1030 1035 1040

Asp Leu Val Ser Leu Ile Cys Glu Asn Arg Ser Met Ser Lys Thr Leu
1045 1050 1055

Lys Glu Tyr Glu Gly Gln Lys Ser Thr Ser Ile Thr Thr Ala Arg Arg
1060 1065 1070

Leu Gly Asp Phe Leu Gly Glu Asp Met Val Lys Asp Lys Gly Leu Gln
1075 1080 1085

Cys Lys Tyr Ile Ile Ser Ser Lys Pro Phe Asn Ala Pro Val Thr Glu
1090 1095 1100

Arg Ala Ile Pro Val Ala Ile Phe Ser Ala Asp Ile Pro Ile Lys Arg
1105 1110 1115 1120

Ser Phe Leu Arg Arg Trp Thr Leu Asp Pro Ser Leu Glu Asp Leu Asp
1125 1130 1135

Ile Arg Thr Ile Ile Asp Trp Gly Tyr Tyr Arg Glu Arg Leu Gly Ser
1140 1145 1150

Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln Gly Val Ser
1155 1160 1165

Asn Pro Val Pro Arg Val Glu His Pro Asp Trp Leu Lys Arg Lys Ile
1170 1175 1180

Ala Thr Lys Glu Asp Lys Phe Lys Gln Thr Ser Leu Thr Lys Phe Phe

19/236

1185	1190	1195	1200
Ser Lys Thr Lys Asn Val Pro Thr Met Gly Lys Ile Lys Asp Ile Glu			
1205	1210	1215	
Asp Leu Phe Glu Pro Thr Val Glu Glu Asp Asn Ala Lys Ile Lys Ile			
1220	1225	1230	
Ala Arg Thr Thr Lys Lys Lys Ala Val Ser Lys Arg Lys Arg Asn Gln			
1235	1240	1245	
Leu Thr Asn Glu Glu Asp Pro Leu Val Leu Pro Ser Glu Ile Pro Ser			
1250	1255	1260	
Met Asp Glu Asp Tyr Val Gly Trp Leu Asn Tyr Gln Lys Ile Lys Trp			
1265	1270	1275	1280
Lys Ile Gln Ala Arg Asp Arg Lys Arg Arg Asp Gln Leu Phe Gly Asn			
1285	1290	1295	
Thr Asn Ser Ser Arg Glu Arg Ser Ala Leu Gly Ser Met Ile Arg Lys			
1300	1305	1310	
Gln Ala Glu Ser Tyr Ala Asn Ser Thr Trp Glu Val Leu Gln Tyr Lys			
1315	1320	1325	
Asp Ser Gly Glu Pro Gly Val Leu Glu Val Phe Val Thr Ile Asn Gly			
1330	1335	1340	
Lys Val Gln Asn Ile Thr Phe His Ile Pro Lys Thr Ile Tyr Met Lys			
1345	1350	1355	1360
Phe Lys Ser Gln Thr Met Pro Leu Gln Lys Ile Lys Asn Cys Leu Ile			
1365	1370	1375	
Glu Lys Ser Ser Ala Ser Leu Pro Asn Asn Pro Lys Thr Ser Asn Pro			
1380	1385	1390	

20/236

Ala Gly Gly Gln Leu Phe Lys Ile Thr Leu Pro Glu Ser Val Phe Leu

1395

1400

1405

Glu Glu Lys Glu Asn Cys Thr Ser Ile Phe Asn Asp Glu Asn Val Leu

1410

1415

1420

Gly Val Phe Glu Gly Thr Ile Thr Pro His Gln Arg Ala Ile Met Asp

1425

1430

1435

1440

Leu Gly Ala Ser Val Thr Phe Arg Ser Lys Ala Met Gly Ala Leu Gly

1445

1450

1455

Lys Gly Ile Gln Gln Gly Phe Glu Met Lys Asp Leu Ser Met Ala Glu

1460

1465

1470

Asn Glu Arg Tyr Leu Ser Gly Phe Ser Met Asp Ile Gly Tyr Leu Leu

1475

1480

1485

His Phe Pro Thr Ser Ile Gly Tyr Glu Phe Phe Ser Leu Phe Lys Ser

1490

1495

1500

Trp Gly Asp Thr Ile Thr Ile Leu Val Leu Lys Pro Ser Asn Gln Ala

1505

1510

1515

1520

Gln Glu Ile Asn Ala Ser Ser Leu Gly Gln Ile Tyr Lys Gln Met Phe

1525

1530

1535

Glu Lys Lys Lys Gly Lys Ile Glu Thr Tyr Ser Tyr Leu Val Asp Ile

1540

1545

1550

Lys Glu Asp Ile Asn Phe Glu Phe Val Tyr Phe Thr Asp Ile Ser Lys

1555

1560

1565

Leu Tyr Arg Arg Leu Ser Gln Glu Thr Thr Lys Leu Lys Glu Glu Arg

1570

1575

1580

21/236

Gly Leu Gln Phe Leu Leu Leu Leu Gln Ser Pro Phe Ile Thr Lys Leu
1585 1590 1595 1600

Leu Gly Thr Ile Arg Leu Leu Asn Gln Met Pro Ile Val Lys Leu Ser
1605 1610 1615

Leu Asn Glu Val Leu Leu Pro Gln Leu Asn Trp Gln Pro Thr Leu Leu
1620 1625 1630

Lys Lys Leu Val Asn His Val Leu Ser Ser Gly Ser Trp Ile Ser His
1635 1640 1645

Leu Ile Lys Leu Ser Gln Tyr Ser Asn Ile Pro Ile Cys Asn Leu Arg
1650 1655 1660

Leu Asp Ser Met Asp Tyr Ile Ile Asp Val Leu Tyr Ala Arg Lys Leu
1665 1670 1675 1680

Lys Lys Glu Asn Ile Val Leu Trp Trp Asn Glu Lys Ala Pro Leu Pro
1685 1690 1695

Asp His Gly Gly Ile Gln Asn Asp Phe Asp Leu Asn Thr Ser Trp Ile
1700 1705 1710

Met Asn Asp Ser Glu Phe Pro Lys Ile Asn Asn Ser Gly Val Tyr Asp
1715 1720 1725

Asn Val Val Leu Asp Val Gly Val Asp Asn Leu Thr Val Asn Thr Ile
1730 1735 1740

Leu Thr Ser Ala Leu Ile Asn Asp Ala Glu Gly Ser Asp Leu Val Asn
1745 1750 1755 1760

Asn Asn Met Gly Ile Asp Asp Lys Asp Ala Val Ile Asn Ser Pro Ser
1765 1770 1775

Glu Phe Val His Asp Ala Phe Ser Asn Asp Ala Leu Asn Val Leu Arg

22/236

1780	1785	1790
Gly Met Leu Lys Glu Trp Trp Asp Glu Ala Leu Lys Glu Asn Ser Thr		
1795	1800	1805
Ala Asp Leu Leu Val Asn Ser Leu Ala Ser Trp Val Gln Asn Pro Asn		
1810	1815	1820
Ala Lys Leu Phe Asp Gly Leu Leu Arg Tyr His Val His Asn Leu Thr		
1825	1830	1835
		1840
Lys Lys Ala Leu Leu Gln Leu Val Asn Glu Phe Ser Ala Leu Gly Ser		
1845	1850	1855
Thr Ile Val Tyr Ala Asp Arg Asn Gln Ile Leu Ile Lys Thr Asn Lys		
1860	1865	1870
Tyr Ser Pro Glu Asn Cys Tyr Ala Tyr Ser Gln Tyr Met Met Lys Ala		
1875	1880	1885
Val Arg Thr Asn Pro Met Phe Ser Tyr Leu Asp Leu Asn Ile Lys Arg		
1890	1895	1900
Tyr Trp Asp Leu Leu Ile Trp Met Asp Lys Phe Asn Phe Ser Gly Leu		
1905	1910	1915
		1920
Ala Cys Ile Glu Ile Glu Glu Lys Glu Asn Gln Asp Tyr Thr Ala Val		
1925	1930	1935
Ser Gln Trp Gln Leu Lys Lys Phe Leu Ser Pro Ile Tyr Gln Pro Glu		
1940	1945	1950
Phe Glu Asp Trp Met Met Ile Ile Leu Asp Ser Met Leu Lys Thr Lys		
1955	1960	1965
Gln Ser Tyr Leu Lys Leu Asn Ser Gly Thr Gln Arg Pro Thr Gln Ile		
1970	1975	1980

23/236

Val Asn Val Lys Lys Gln Asp Lys Glu Asp Ser Val Glu Asn Ser Leu
1985 1990 1995 2000

Asn Gly Phe Ser His Leu Phe Ser Lys Pro Leu Met Lys Arg Val Lys
 2005 2010 2015

Lys Leu Phe Lys Asn Gln Gln Glu Phe Ile Leu Asp Pro Gln Tyr Glu
 2020 2025 2030

Ala Asp Tyr Val Ile Pro Val Leu Pro Gly Ser His Leu Asn Val Lys
 2035 2040 2045

Asn Pro Leu Leu Glu Leu Val Lys Ser Leu Cys His Val Met Leu Leu
 2050 2055 2060

Ser Lys Ser Thr Ile Leu Glu Ile Arg Thr Leu Arg Lys Glu Leu Leu
2065 2070 2075 2080

Lys Ile Phe Glu Leu Arg Glu Phe Ala Lys Val Ala Glu Phe Lys Asp
 2085 2090 2095

Pro Ser Leu Ser Leu Val Val Pro Asp Phe Leu Cys Glu Tyr Cys Phe
 2100 2105 2110

Phe Ile Ser Asp Ile Asp Phe Cys Lys Ala Ala Pro Glu Ser Ile Phe
 2115 2120 2125

Ser Cys Val Arg Cys His Lys Ala Phe Asn Gln Val Leu Leu Gln Glu
 2130 2135 2140

His Leu Ile Gln Lys Leu Arg Ser Asp Ile Glu Ser Tyr Leu Ile Gln
2145 2150 2155 2160

Asp Leu Arg Cys Ser Arg Cys His Lys Val Lys Arg Asp Tyr Met Ser
 2165 2170 2175

24/236

Ala His Cys Pro Cys Ala Gly Ala Trp Glu Gly Thr Leu Pro Arg Glu

2180

2185

2190

Ser Ile Val Gln Lys Leu Asn Val Phe Lys Gln Val Ala Lys Tyr Tyr

2195

2200

2205

Gly Phe Asp Ile Leu Leu Ser Cys Ile Ala Asp Leu Thr Ile

2210

2215

2220

<210> 5

<211> 12

<212> PRT

<213> Escherichia coli

<400> 5

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

1

5

10

<210> 6

<211> 12

<212> PRT

<213> Haemophilus influenzae

<400> 6

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

1

5

10

<210> 7

<211> 12

<212> PRT

<213> Salmonella typhimurium

25/236

<400> 7

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn
1 5 10

<210> 8

<211> 12

<212> PRT

<213> *Vibrio cholerae*

<400> 8

Ile Val Val Leu Asp Thr Glu Thr Thr Gly Met Asn
1 5 10

<210> 9

<211> 12

<212> PRT

<213> *Pseudomonas aeruginosa*

<400> 9

Ser Val Val Leu Asp Thr Glu Thr Thr Gly Met Pro
1 5 10

<210> 10

<211> 12

<212> PRT

<213> *Neisseria meningitidis*

<400> 10

Gln Ile Ile Leu Asp Thr Glu Thr Thr Gly Leu Tyr
1 5 10

<210> 11

26/236

<211> 12

<212> PRT

<213> Chlamydia trachomatis

<400> 11

Phe Val Cys Leu Asp Cys Glu Thr Thr Gly Leu Asp

1

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<210> 12

<211> 12

<212> PRT

<213> Streptomyces coelicolor

<400> 12

Leu Ala Ala Phe Asp Thr Glu Thr Thr Gly Val Asp

1

5

10

<210> 13

<211> 12

<212> PRT

<213> Shigella flexneri 2a str. 301

<400> 13

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

1

5

10

<210> 14

<211> 12

<212> PRT

<213> Staphylococcus aureus

<400> 14

Tyr Val Val Phe Asp Val Glu Thr Thr Gly Leu Ser

1

5

10

27/236

<210> 15

<211> 12

<212> PRT

<213> *Bacillus subtilis*

<400> 15

Tyr Val Val Phe Asp Val Glu Thr Thr Gly Leu Ser

1

5

10

<210> 16

<211> 12

<212> PRT

<213> *Mycoplasma pulmonis*

<400> 16

Tyr Val Val Tyr Asp Ile Glu Thr Thr Gly Leu Ser

1

5

10

<210> 17

<211> 12

<212> PRT

<213> *Mycoplasma genitalium*

<400> 17

Phe Val Ile Phe Asp Ile Glu Thr Thr Gly Leu His

1

5

10

<210> 18

<211> 12

<212> PRT

<213> *Mycoplasma pneumoniae*

28/236

<400> 18

Phe Val Ile Phe Asp Ile Glu Thr Thr Gly Leu His

1

5

10

<210> 19

<211> 12

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 19

Ile Met Ser Phe Asp Ile Glu Cys Ala Gly Arg Ile

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<210> 20

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<213> *Saccharomyces cerevisiae*

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5

10

<210> 21

<211> 12

<212> PRT

<213> *Mus musculus*

<400> 21

Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys

1

5

10

<210> 22

<211> 12

29/236

<212> PRT

<213> Mus musculus

<400> 22

Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro

1

5

10

<210> 23

<211> 12

<212> PRT

<213> Homo sapiens

<400> 23

Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys

1

5

10

<210> 24

<211> 12

<212> PRT

<213> Homo sapiens

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Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro

1

5

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<210> 25

<211> 12

<212> PRT

<213> Oryza sativa

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30/236

<210> 26

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<213> *Arabidopsis thaliana*

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<210> 27

<211> 12

<212> PRT

<213> *Arabidopsis thaliana*

<400> 27

Val Cys Ala Phe Asp Ile Glu Thr Val Lys Leu Pro

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5

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<210> 28

<211> 12

<212> PRT

<213> *Rattus norvegicus*

<400> 28

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5

10

<210> 29

<211> 12

<212> PRT

<213> *Bos taurus*

<400> 29

31/236

Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 30

<211> 12

<212> PRT

<213> Glycine max

<400> 30

Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 31

<211> 12

<212> PRT

<213> *Drosophila melanogaster*

<400> 31

Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 32

<211> 12

<212> PRT

<213> *Drosophila melanogaster*

<400> 32

Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro
1 5 10

<210> 33

<211> 36

<212> DNA

32/236

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol delta

<400> 33

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36

<210> 34

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol delta

<400> 34

Ile Met Ser Phe Ala Ile Ala Cys Ala Gly Arg Ile

1

5

10

<210> 35

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol epsilon

<400> 35

gtaatggcat ttgctatagc taccacgaag ccgcct

36

<210> 36

<211> 7

<212> PRT

33/236

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol epsilon

<400> 36

Val Met Ala Phe Ala Ile Ala Thr Thr Lys Pro Pro

1 5 10

<210> 37

<211> 14

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

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<210> 38

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 38

CCCGCGGCCG CTTACCATTT GCTTAATTGT 30

<210> 39

<211> 12

<212> DNA

34/236

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 39

CCCGAGGTCA TGATGTTTGG CAAGAAAAAA

30

<210> 40

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 40

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30

<210> 41

<211> 1592

<212> DNA

<213> Escherichia coli

<400> 41

gaattcaaat acaaaaaaac cgcaaaatta aaaatcttgc ggctctctga actcattttc 60
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ggtattcaac cgactgaact accgctccgc gtigtgttcc gttgggaacg aggcgaaatag 180
ttacgaattg cctcgacctc gtcaacggtt tttctatctt ttgaatogtt tgctgcaaaa 240
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tccgcctttc ttctgcacca gatcgagacg ggcttcatga gctgcaatct cttcatctgt 360
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cgccagataa acttccgcaa ggatctgggc atcgagtaat gccccgtgca gcgttcgttt 540
actgttatct atttcgtagc gagcacataa cgcacgagg ctgttgcgct taccgggaaa 600

35/236

cattttcctc gccacgcaa ggctatcggt gaccttacag aaagtattgg tcttcggaat 660
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ttgccgggtg gctccaaccg cctagcgaat tc 1592

<210> 42

<211> 243

<212> PRT

<213> Escherichia coli

<400> 42

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1

5

10

15

Gly Met Asn Gln Ile Gly Ala His Tyr Glu Gly His Lys Ile Ile Glu

20

25

30

Ile Gly Ala Val Glu Val Val Asn Arg Arg Leu Thr Gly Asn Asn Phe

35

40

45

His Val Tyr Leu Lys Pro Asp Arg Leu Val Asp Pro Glu Ala Phe Gly

50

55

60

36/236

Val His Gly Ile Ala Asp Glu Phe Leu Leu Asp Lys Pro Thr Phe Ala
65 70 75 80

Glu Val Ala Asp Glu Phe Met Asp Tyr Ile Arg Gly Ala Glu Leu Val
85 90 95

Ile His Asn Ala Ala Phe Asp Ile Gly Phe Met Asp Tyr Glu Phe Ser
100 105 110

Leu Leu Lys Arg Asp Ile Pro Lys Thr Asn Thr Phe Cys Lys Val Thr
115 120 125

Asp Ser Leu Ala Val Ala Arg Lys Met Phe Pro Gly Lys Arg Asn Ser
130 135 140

Leu Asp Ala Leu Cys Ala Arg Tyr Glu Ile Asp Asn Ser Lys Arg Thr
145 150 155 160

Leu His Gly Ala Leu Leu Asp Ala Gln Ile Leu Ala Glu Val Tyr Leu
165 170 175

Ala Met Thr Gly Gly Gln Thr Ser Met Ala Phe Ala Met Glu Gly Glu
180 185 190

Thr Gln Gln Gln Gln Gly Glu Ala Thr Ile Gln Arg Ile Val Arg Gln
195 200 205

Ala Ser Lys Leu Arg Val Val Phe Ala Thr Asp Glu Glu Ile Ala Ala
210 215 220

His Glu Ala Arg Leu Asp Leu Val Gln Lys Lys Gly Gly Ser Cys Leu
225 230 235 240

Trp Arg Ala

37/236

<210> 43

<211> 4866

<212> DNA

<213> *Bacillus subtilis*

<400> 43

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caagagcggg ctatgcaggc cttgattgaa atggagaaga aagataaaga aagtatgaa 660
gaccaagcac catctggtcc tctgttatac gggtatcaaa ttaaagataa cgaggaaatc 720
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gctgaaaaag gtattcagta ccatgatgag ttgaatgaaa atatgggtca gtccaatgct 1860

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ccgagatctc agcttgagaa atacagggaa gggcttctga tcggttctgc ttgtgacagg 2040
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acaatgatca agggctctac agcaatcaga gcgtaaatgg aggatataaa cgctaaagga 4020
cttgatgctt caccgaagga aaagaacctt ctgactgttt tagaattagc gcttgagatg 4080

39/236

tgtgagagag gctattcatt caaaaaagtc gatttatatc gctccagcgc cacagagttt 4140
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 aagctt 4866

<210> 44

<211> 1437

<212> PRT

<213> *Bacillus subtilis*

<400> 44

Met Glu Gln Leu Ser Val Asn Arg Arg Gln Phe Gln Ile Leu Leu Gln

1

5

10

15

Gln Ile Asn Met Thr Asp Asp Thr Phe Met Thr Tyr Phe Glu His Gly

20

25

30

Glu Ile Lys Lys Leu Thr Ile His Lys Ala Ser Lys Ser Trp His Phe

35

40

45

His Phe Gln Phe Lys Ser Leu Leu Pro Phe Gln Ile Tyr Asp Thr Leu

50

55

60

Thr Thr Arg Leu Thr Gln Ser Phe Ala His Ile Ala Lys Val Thr Ser

65

70

75

80

40/236

Ser Ile Glu Val Gln Asp Ala Glu Val Ser Glu Ser Ile Val Gln Asp
85 90 95

Tyr Trp Ser Arg Cys Ile Glu Glu Leu Gln Gly Ile Ser Pro Pro Ile
100 105 110

Ile Ser Leu Leu Asn Gln Gln Lys Pro Lys Leu Lys Gly Asn Lys Leu
115 120 125

Ile Val Lys Thr Lys Thr Asp Thr Glu Ala Ala Ala Leu Lys Asn Lys
130 135 140

Tyr Ser Ser Met Ile Gln Ala Glu Tyr Arg Gln Phe Gly Phe Pro Asp
145 150 155 160

Leu Gln Leu Asp Ala Glu Ile Phe Val Ser Glu Gln Glu Val Gln Lys
165 170 175

Phe Arg Glu Gln Lys Leu Ala Glu Asp Gln Glu Arg Ala Met Gln Ala
180 185 190

Leu Ile Glu Met Glu Lys Lys Asp Lys Glu Ser Asp Glu Asp Gln Ala
195 200 205

Pro Ser Gly Pro Leu Val Ile Gly Tyr Gln Ile Lys Asp Asn Glu Glu
210 215 220

Ile Arg Thr Leu Asp Ser Ile Met Asp Glu Glu Arg Arg Ile Thr Val
225 230 235 240

Gln Gly Tyr Val Phe Asp Val Glu Thr Arg Glu Leu Lys Ser Gly Arg
245 250 255

Thr Leu Cys Ile Phe Lys Ile Thr Asp Tyr Thr Asn Ser Ile Leu Ile
260 265 270

Lys Met Phe Ala Arg Glu Lys Glu Asp Ala Ala Leu Met Lys Ser Leu

41/236

275	280	285	
Lys Lys Gly Met Trp Val	Lys Ala Arg Gly Ser Ile	Gln Asn Asp Thr	
290	295	300	
Phe Val Arg Asp Leu Val	Met Ile Ala Asn Asp Val	Asn Glu Ile Lys	
305	310	315	320
Ala Lys Thr Arg Glu Asp	Ser Ala Pro Glu Gly Glu	Lys Arg Val Glu	
325	330	335	
Leu His Leu His Ser Pro	Met Ser Gln Met Asp Ala	Val Thr Gly Ile	
340	345	350	
Gly Lys Leu Val Glu Gln	Ala Lys Lys Trp Gly His	Glu Ala Ile Ala	
355	360	365	
Leu Thr Asp His Ala Val	Val Gln Ser Phe Pro Asp	Ala Tyr Ser Ala	
370	375	380	
Ala Lys Lys His Gly Ile	Lys Met Ile Tyr Gly Met	Glu Ala Asn Leu	
385	390	395	400
Val Asp Asp Gly Val Pro	Ile Ala Tyr Asn Ala Ala	His Arg Leu Leu	
405	410	415	
Glu Glu Glu Thr Tyr Val	Val Phe Asp Val Glu Thr	Thr Gly Leu Ser	
420	425	430	
Ala Val Tyr Asp Thr Ile	Ile Glu Leu Ala Ala Val	Lys Val Lys Gly	
435	440	445	
Gly Glu Ile Ile Asp Lys	Phe Glu Ala Phe Ala Asn	Pro His Arg Pro	
450	455	460	
Leu Ser Ala Thr Ile Ile	Glu Leu Thr Gly Ile Thr	Asp Asp Met Leu	
465	470	475	480

42/236

Gln Asp Ala Pro Asp Val Val Asp Val Ile Arg Asp Phe Arg Glu Trp

485

490

495

Ile Gly Asp Asp Ile Leu Val Ala His Asn Ala Ser Phe Asp Met Gly

500

505

510

Phe Leu Asn Val Ala Tyr Lys Lys Leu Leu Glu Val Glu Lys Ala Lys

515

520

525

Asn Pro Val Ile Asp Thr Leu Glu Leu Gly Arg Phe Leu Tyr Pro Glu

530

535

540

Phe Lys Asn His Arg Leu Asn Thr Leu Cys Lys Lys Phe Asp Ile Glu

545

550

555

560

Leu Thr Gln His His Arg Ala Ile Tyr Asp Thr Glu Ala Thr Ala Tyr

565

570

575

Leu Leu Leu Lys Met Leu Lys Asp Ala Ala Glu Lys Gly Ile Gln Tyr

580

585

590

His Asp Glu Leu Asn Glu Asn Met Gly Gln Ser Asn Ala Tyr Gln Arg

595

600

605

Ser Arg Pro Tyr His Ala Thr Leu Leu Ala Val Asn Ser Thr Gly Leu

610

615

620

Lys Asn Leu Phe Lys Leu Val Ser Leu Ser His Ile His Tyr Phe Tyr

625

630

635

640

Arg Val Pro Arg Ile Pro Arg Ser Gln Leu Glu Lys Tyr Arg Glu Gly

645

650

655

Leu Leu Ile Gly Ser Ala Cys Asp Arg Gly Glu Val Phe Glu Gly Met

660

665

670

43/236

Met Gln Lys Ser Pro Glu Glu Val Glu Asp Ile Ala Ser Phe Tyr Asp
675 680 685

Tyr Leu Glu Val Gln Pro Pro Glu Val Tyr Arg His Leu Leu Glu Leu
690 695 700

Glu Leu Val Arg Asp Glu Lys Ala Leu Lys Glu Ile Ile Ala Asn Ile
705 710 715 720

Thr Lys Leu Gly Glu Lys Leu Asn Lys Pro Val Val Ala Thr Gly Asn
725 730 735

Val His Tyr Leu Asn Asp Glu Asp Lys Ile Tyr Arg Lys Ile Leu Ile
740 745 750

Ser Ser Gln Gly Gly Ala Asn Pro Leu Asn Arg His Glu Leu Pro Lys
755 760 765

Val His Phe Arg Thr Thr Asp Glu Met Leu Glu Ala Phe Ser Phe Leu
770 775 780

Gly Glu Glu Lys Ala Lys Glu Ile Val Val Thr Asn Thr Gln Lys Val
785 790 795 800

Ala Ser Leu Val Asp Asp Ile Lys Pro Ile Lys Asp Asp Leu Tyr Thr
805 810 815

Pro Lys Ile Glu Gly Ala Asp Glu Glu Ile Arg Glu Met Ser Tyr Gln
820 825 830

Arg Ala Arg Ser Ile Tyr Gly Glu Glu Leu Pro Glu Ile Val Glu Ala
835 840 845

Arg Ile Glu Lys Glu Leu Lys Ser Ile Ile Gly His Gly Phe Ala Val
850 855 860

Ile Tyr Leu Ile Ser His Lys Leu Val Lys Arg Ser Leu Asp Asp Gly

44/236

865	870	875	880
Tyr Leu Val Gly Ser Arg Gly Ser Val Gly Ser Ser Leu Val Ala Thr			
	885	890	895
Leu Thr Glu Ile Thr Glu Val Asn Pro Leu Pro Pro His Tyr Val Cys			
	900	905	910
Pro Glu Cys Gln His Ser Glu Phe Phe Asn Asp Gly Ser Val Gly Ser			
	915	920	925
Gly Phe Asp Leu Pro Asp Lys Thr Cys Pro His Cys Gly Thr Pro Leu			
	930	935	940
Lys Lys Asp Gly His Asp Ile Pro Phe Glu Thr Phe Leu Gly Phe Lys			
	945	950	955
			960
Gly Asp Lys Val Pro Asp Ile Asp Leu Asn Phe Ser Gly Glu Tyr Gln			
	965	970	975
Pro Gln Ala His Asn Tyr Thr Lys Val Leu Phe Gly Glu Asp Asn Val			
	980	985	990
Tyr Arg Ala Gly Thr Ile Gly Thr Val Ala Glu Lys Thr Ala Tyr Gly			
	995	1000	1005
Tyr Val Lys Gly Tyr Ala Gly Asp Asn Asn Leu His Met Arg Gly Ala			
	1010	1015	1020
Glu Ile Asp Arg Leu Val Gln Gly Cys Thr Gly Val Lys Arg Thr Thr			
	1025	1030	1035
			1040
Gly Gln His Pro Gly Gly Ile Ile Val Val Pro Asp Tyr Met Asp Ile			
	1045	1050	1055
Tyr Asp Phe Ser Pro Ile Gln Phe Pro Ala Asp Ala Thr Gly Ser Glu			
	1060	1065	1070

45/236

Trp Lys Thr Thr His Phe Asp Phe His Ser Ile His Asp Asn Leu Leu

1075

1080

1085

Lys Leu Asp Ile Leu Gly His Asp Asp Pro Thr Val Ile Arg Met Leu

1090

1095

1100

Gln Asp Leu Ser Gly Ile Asp Pro Lys Thr Ile Pro Thr Asp Asp Pro

1105

1110

1115

1120

Glu Val Met Lys Ile Phe Gln Gly Thr Glu Ser Leu Gly Val Thr Glu

1125

1130

1135

Glu Gln Ile Gly Cys Lys Thr Gly Thr Leu Gly Ile Pro Glu Phe Gly

1140

1145

1150

Thr Arg Phe Val Arg Gln Met Leu Glu Asp Thr Lys Pro Thr Thr Phe

1155

1160

1165

Ser Glu Leu Val Gln Ile Ser Gly Leu Ser His Gly Thr Asp Val Trp

1170

1175

1180

Leu Gly Asn Ala Gln Glu Leu Ile His Asn Asn Ile Cys Glu Leu Ser

1185

1190

1195

1200

Glu Val Ile Gly Cys Arg Asp Asp Ile Met Val Tyr Leu Ile Tyr Gln

1205

1210

1215

Gly Leu Glu Pro Ser Leu Ala Phe Lys Ile Met Glu Phe Val Arg Lys

1220

1225

1230

Gly Lys Gly Leu Thr Pro Glu Trp Glu Glu Glu Met Lys Asn Asn Asn

1235

1240

1245

Val Pro Asp Trp Tyr Ile Asp Ser Cys Lys Lys Ile Lys Tyr Met Phe

1250

1255

1260

46/236

Pro Lys Ala His Ala Ala Ala Tyr Val Leu Met Ala Val Arg Ile Ala
1265 1270 1275 1280

Tyr Phe Lys Val His His Ala Leu Leu Tyr Tyr Ala Ala Tyr Phe Thr
1285 1290 1295

Val Arg Ala Asp Asp Phe Asp Ile Asp Thr Met Ile Lys Gly Ser Thr
1300 1305 1310

Ala Ile Arg Ala Val Met Glu Asp Ile Asn Ala Lys Gly Leu Asp Ala
1315 1320 1325

Ser Pro Lys Glu Lys Asn Leu Leu Thr Val Leu Glu Leu Ala Leu Glu
1330 1335 1340

Met Cys Glu Arg Gly Tyr Ser Phe Gln Lys Val Asp Leu Tyr Arg Ser
1345 1350 1355 1360

Ser Ala Thr Glu Phe Ile Ile Asp Gly Asn Ser Leu Ile Pro Pro Phe
1365 1370 1375

Asn Ser Ile Pro Gly Leu Gly Thr Asn Ala Ala Leu Asn Ile Val Lys
1380 1385 1390

Ala Arg Glu Glu Gly Glu Phe Leu Ser Lys Glu Asp Leu Gln Lys Arg
1395 1400 1405

Gly Lys Val Ser Lys Thr Ile Leu Glu Tyr Leu Asp Arg His Gly Cys
1410 1415 1420

Leu Glu Ser Leu Pro Asp Gln Asn Gln Leu Ser Leu Phe
1425 1430 1435

<210> 45

<211> 1081

47/236

<212> PRT

<213> *Arabidopsis thaliana*

<400> 45

Met Asn Arg Ser Gly Ile Ser Lys Lys Arg Pro Pro Pro Ser Asn Thr
 1 5 10 15

Pro Pro Pro Ala Gly Lys His Arg Ala Thr Gly Asp Ser Thr Pro Ser
 20 25 30

Pro Ala Ile Gly Thr Leu Asp Asp Glu Phe Met Met Glu Glu Asp Val
 35 40 45

Phe Leu Asp Glu Thr Leu Leu Tyr Gly Asp Glu Asp Glu Glu Ser Leu
 50 55 60

Ile Leu Arg Asp Ile Glu Glu Arg Glu Ser Arg Ser Ser Ala Trp Ala
 65 70 75 80

Arg Pro Pro Leu Ser Pro Ala Tyr Leu Ser Asn Ser Gln Ile Phe Gln
 85 90 95

Gln Leu Glu Ile Asp Ser Ile Ile Ala Glu Ser His Lys Glu Leu Leu
 100 105 110

Pro Gly Ser Ser Gly Gln Ala Pro Ile Ile Arg Met Phe Gly Val Thr
 115 120 125

Arg Glu Gly Asn Ser Val Cys Cys Phe Val His Gly Phe Glu Pro Tyr
 130 135 140

Phe Tyr Ile Ala Cys Pro Pro Gly Met Gly Pro Asp Asp Ile Ser Asn
 145 150 155 160

Phe His Gln Ser Leu Glu Gly Arg Met Arg Glu Ser Asn Lys Asn Ala
 165 170 175

48/236

Lys Val Pro Lys Phe Val Lys Arg Ile Glu Met Val Gln Lys Arg Ser
180 185 190

Ile Met Tyr Tyr Gln Gln Gln Lys Ser Gln Thr Phe Leu Lys Ile Thr
195 200 205

Val Ala Leu Pro Thr Met Val Ala Ser Cys Arg Gly Ile Leu Asp Arg
210 215 220

Gly Leu Gln Ile Asp Gly Leu Gly Met Lys Ser Phe Gln Thr Tyr Glu
225 230 235 240

Ser Asn Ile Leu Phe Val Leu Arg Phe Met Val Asp Cys Asp Ile Val
245 250 255

Gly Gly Asn Trp Ile Glu Val Pro Thr Gly Lys Tyr Lys Lys Asn Ala
260 265 270

Arg Thr Leu Ser Tyr Cys Gln Leu Glu Phe His Cys Leu Tyr Ser Asp
275 280 285

Leu Ile Ser His Ala Ala Glu Gly Glu Tyr Ser Lys Met Ala Pro Phe
290 295 300

Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly His Phe
305 310 315 320

Pro Glu Ala Lys His Asp Pro Val Ile Gln Ile Ala Asn Leu Val Thr
325 330 335

Leu Gln Gly Glu Asp His Pro Phe Val Arg Asn Val Met Thr Leu Lys
340 345 350

Ser Cys Ala Pro Ile Val Gly Val Asp Val Met Ser Phe Glu Thr Glu
355 360 365

49/236

Arg Glu Val Leu Leu Ala Trp Arg Asp Leu Ile Arg Asp Val Asp Pro
370 375 380

Asp Ile Ile Ile Gly Tyr Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu
385 390 395 400

Ile Glu Arg Ala Ala Thr Leu Gly Ile Glu Glu Phe Pro Leu Leu Gly
405 410 415

Arg Val Lys Asn Ser Arg Val Arg Val Arg Asp Ser Thr Phe Ser Ser
420 425 430

Arg Gln Gln Gly Ile Arg Glu Ser Lys Glu Thr Thr Ile Glu Gly Arg
435 440 445

Phe Gln Phe Asp Leu Ile Gln Ala Ile His Arg Asp His Lys Leu Ser
450 455 460

Ser Tyr Ser Leu Asn Ser Val Ser Ala His Phe Leu Ser Glu Gln Lys
465 470 475 480

Glu Asp Val His His Ser Ile Ile Thr Asp Leu Gln Asn Gly Asn Ala
485 490 495

Glu Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu
500 505 510

Pro Gln Arg Leu Leu Asp Lys Leu Met Phe Ile Tyr Asn Tyr Val Glu
515 520 525

Met Ala Arg Val Thr Gly Val Pro Ile Ser Phe Leu Leu Ala Arg Gly
530 535 540

Gln Ser Ile Lys Val Leu Ser Gln Leu Leu Arg Lys Gly Lys Gln Lys
545 550 555 560

Asn Leu Val Leu Pro Asn Ala Lys Gln Ser Gly Ser Glu Gln Gly Thr

50/236

565	570	575
Tyr Glu Gly Ala Thr Val Leu Glu Ala Arg Thr Gly Phe Tyr Glu Lys		
580	585	590
Pro Ile Ala Thr Leu Asp Phe Ala Ser Leu Tyr Pro Ser Ile Met Met		
595	600	605
Ala Tyr Asn Leu Cys Tyr Cys Thr Leu Val Thr Pro Glu Asp Val Arg		
610	615	620
Lys Leu Asn Leu Pro Pro Glu His Val Thr Lys Thr Pro Ser Gly Glu		
625	630	635
Thr Phe Val Lys Gln Thr Leu Gln Lys Gly Ile Leu Pro Glu Ile Leu		
645	650	655
Glu Glu Leu Leu Thr Ala Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu		
660	665	670
Ala Lys Asp Pro Leu Glu Lys Ala Val Leu Asp Gly Arg Gln Leu Ala		
675	680	685
Leu Lys Ile Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala Thr Val		
690	695	700
Gly Gln Leu Pro Cys Leu Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly		
705	710	715
Arg Gln Met Ile Glu Gln Thr Lys Lys Leu Val Glu Asp Lys Phe Thr		
725	730	735
Thr Leu Gly Gly Tyr Gln Tyr Asn Ala Glu Val Ile Tyr Gly Asp Thr		
740	745	750
Asp Ser Val Met Val Gln Phe Gly Val Ser Asp Val Glu Ala Ala Met		

51/236

755	760	765	
Thr Leu Gly Arg Glu Ala Ala Glu His Ile Ser Gly Thr Phe Ile Lys			
770	775	780	
Pro Ile Lys Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu Leu Ile			
785	790	795	800
Asn Lys Lys Arg Tyr Ala Gly Leu Leu Trp Thr Asn Pro Gln Gln Phe			
805	810	815	
Asp Lys Met Asp Thr Lys Gly Ile Glu Thr Val Arg Arg Asp Asn Cys			
820	825	830	
Leu Leu Val Lys Asn Leu Val Thr Glu Ser Leu Asn Lys Ile Leu Ile			
835	840	845	
Asp Arg Asp Val Pro Gly Ala Ala Glu Asn Val Lys Lys Thr Ile Ser			
850	855	860	
Asp Leu Leu Met Asn Arg Ile Asp Leu Ser Leu Leu Val Ile Thr Lys			
865	870	875	880
Gly Leu Thr Lys Thr Gly Asp Asp Tyr Glu Val Lys Ser Ala His Gly			
885	890	895	
Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Ala Ala Thr Ala Pro Asn			
900	905	910	
Val Gly Asp Arg Val Pro Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala			
915	920	925	
Lys Ala Tyr Glu Arg Ser Glu Asp Pro Ile Tyr Val Leu Gln Asn Asn			
930	935	940	
Ile Pro Ile Asp Pro Asn Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro			
945	950	955	960

52/236

Leu Leu Arg Ile Phe Glu Pro Val Leu Lys Asn Ala Ser Lys Glu Leu

965

970

975

Leu His Gly Ser His Thr Arg Ser Ile Ser Ile Thr Thr Pro Ser Asn

980

985

990

Ser Gly Ile Met Lys Phe Ala Lys Lys Gln Leu Ser Cys Val Gly Cys

995

1000

1005

Lys Val Pro Ile Arg Tyr Phe Val Gln Trp Asn Thr Met Arg Lys Leu

1010

1015

1020

Gln Gly Lys Arg Ser Arg Val Ile Leu Gln Lys Arg Val Ser Arg Tyr

1025

1030

1035

1040

Ala Ala Trp Leu Ser Leu Lys Arg Phe Leu Gly Gly Cys Gly His Ser

1045

1050

1055

Ala Arg Ser Val Lys Ala Leu Phe Ile Lys Met Ser Cys Ala Pro Val

1060

1065

1070

Glu Ile Val Gln Tyr Phe Thr Gly Glu

1075

1080

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<211> 2154

<212> PRT

<213> Arabidopsis thaliana

<400> 46

Met Ser Gly Arg Arg Cys Asp Arg Arg Leu Asn Val Gln Lys Val Ser

1

5

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15

Ala Ala Asp Glu Leu Glu Thr Lys Leu Gly Phe Gly Leu Phe Ser Gln

20

25

30

53/236

Gly Glu Thr Arg Leu Gly Trp Leu Leu Thr Phe Ala Ser Ser Ser Trp

35

40

45

Glu Asp Ala Asp Thr Gly Lys Thr Phe Ser Cys Val Asp Leu Phe Phe

50

55

60

Val Thr Gln Asp Gly Ser Ser Phe Lys Thr Lys Tyr Lys Phe Arg Pro

65

70

75

80

Tyr Leu Tyr Ala Ala Thr Lys Asp Asn Met Glu Leu Glu Val Glu Ala

85

90

95

Tyr Leu Arg Arg Arg Tyr Glu Arg Gln Val Ala Asp Ile Gln Ile Val

100

105

110

His Lys Glu Asp Leu Tyr Leu Lys Asn His Leu Ser Gly Leu Gln Lys

115

120

125

Lys Tyr Leu Lys Val Ser Phe Asp Thr Val Gln Gln Leu Val Glu Val

130

135

140

Lys Arg Asp Leu Leu His Ile Val Glu Arg Asn Leu Ala Lys Phe Asn

145

150

155

160

Ala Leu Glu Ala Tyr Glu Ser Ile Leu Ser Gly Lys Arg Glu Gln Arg

165

170

175

Pro Gln Asp Cys Leu Asp Ser Val Val Asp Leu Arg Glu Tyr Asp Val

180

185

190

Pro Tyr His Val Arg Phe Ala Ile Asp Asn Asp Val Arg Ser Gly Gln

195

200

205

Trp Tyr Asn Val Ser Ile Ser Ser Thr Asp Val Ile Leu Glu Lys Arg

210

215

220

54/236

Thr Asp Leu Leu Gln Arg Ala Glu Val Arg Val Cys Ala Phe Asp Ile
225 230 235 240

Glu Thr Val Lys Leu Pro Leu Lys Phe Pro Asp Ala Glu Tyr Asp Gln
245 250 255

Ile Met Met Ile Ser Tyr Met Val Asp Gly Gln Gly Phe Leu Ile Thr
260 265 270

Asn Arg Glu Cys Val Gly Lys Asp Ile Glu Asp Leu Glu Tyr Thr Pro
275 280 285

Lys Pro Glu Phe Glu Gly Tyr Phe Lys Val Thr Asn Val Thr Asn Glu
290 295 300

Val Glu Leu Leu Arg Lys Trp Phe Ser His Met Gln Glu Leu Lys Pro
305 310 315 320

Gly Ile Tyr Val Thr Tyr Asn Gly Asp Phe Phe Asp Trp Pro Phe Ile
325 330 335

Glu Arg Arg Ala Ser His His Gly Ile Lys Met Asn Glu Glu Leu Gly
340 345 350

Phe Arg Cys Asp Gln Asn Gln Gly Glu Cys Arg Ala Lys Phe Val Cys
355 360 365

His Leu Asp Cys Phe Ser Trp Val Lys Arg Asp Ser Tyr Leu Pro Gln
370 375 380

Gly Ser Gln Gly Leu Lys Ala Val Thr Lys Val Lys Leu Gly Tyr Asp
385 390 395 400

Pro Leu Glu Val Asn Pro Glu Asp Met Val Arg Phe Ala Met Glu Lys
405 410 415

55/236

Pro Gln Thr Met Ala Ser Tyr Ser Val Ser Asp Ala Val Ala Thr Tyr
420 425 430

Tyr Leu Tyr Met Thr Tyr Val His Pro Phe Val Phe Ser Leu Ala Thr
435 440 445

Ile Ile Pro Met Val Pro Asp Glu Val Leu Arg Lys Gly Ser Gly Thr
450 455 460

Leu Cys Glu Met Leu Leu Met Val Glu Ala Tyr Lys Ala Asn Val Val
465 470 475 480

Cys Pro Asn Lys Asn Gln Ala Asp Pro Glu Lys Phe Tyr Gln Gly Lys
485 490 495

Leu Leu Glu Ser Glu Thr Tyr Ile Gly Gly His Val Glu Cys Leu Gln
500 505 510

Ser Gly Val Phe Arg Ser Asp Ile Pro Thr Ser Phe Lys Leu Asp Ala
515 520 525

Ser Ala Tyr Gln Gln Leu Ile Asp Asn Leu Gly Arg Asp Leu Glu Tyr
530 535 540

Ala Ile Thr Val Glu Gly Lys Met Arg Met Asp Ser Val Ser Asn Phe
545 550 555 560

Asp Glu Val Lys Glu Val Ile Arg Glu Lys Leu Glu Lys Leu Arg Asp
565 570 575

Asp Pro Ile Arg Glu Glu Gly Pro Leu Ile Tyr His Leu Asp Val Ala
580 585 590

Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu Gln Pro Pro Ser
595 600 605

Ile Val Thr Asp Glu Val Cys Thr Ala Cys Asp Phe Asn Gly Pro Glu

56/236

610	615	620	
Lys Thr Cys Leu Arg Lys Leu Glu Trp Val Trp Arg Gly Val Thr Phe			
625	630	635	640
Lys Gly Asn Lys Ser Glu Tyr Tyr His Leu Lys Lys Gln Ile Glu Ser			
645	650	655	
Glu Ser Val Asp Ala Gly Ala Asn Met Gln Ser Ser Lys Pro Phe Leu			
660	665	670	
Asp Leu Pro Lys Val Glu Gln Gln Ser Lys Leu Lys Glu Arg Leu Lys			
675	680	685	
Lys Tyr Cys Gln Lys Ala Tyr Ser Arg Val Leu Asp Lys Pro Ile Thr			
690	695	700	
Glu Val Arg Glu Ala Gly Ile Cys Met Arg Glu Asn Pro Phe Tyr Val			
705	710	715	720
Asp Thr Val Arg Ser Phe Arg Asp Arg Arg Tyr Glu Tyr Lys Thr Leu			
725	730	735	
Asn Lys Val Trp Lys Gly Lys Leu Ser Glu Ala Lys Ala Ser Gly Asn			
740	745	750	
Leu Ile Lys Ile Gln Glu Ala His Asp Met Val Val Val Tyr Asp Ser			
755	760	765	
Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr Gly Tyr Val			
770	775	780	
Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala Gly Val Val			
785	790	795	800
Thr Tyr Thr Gly Ala Lys Ile Ile Gln Asn Ala Arg Leu Leu Ile Glu			
805	810	815	

57/236

Arg Ile Gly Lys Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp Cys Ala

820

825

830

Leu Pro Gly Ser Phe Pro Glu Asn Phe Thr Phe Lys Thr Ile Asp Met

835

840

845

Lys Lys Phe Thr Ile Ser Tyr Pro Cys Val Ile Leu Asn Val Asp Val

850

855

860

Ala Lys Asn Asn Ser Asn Asp Gln Tyr Gln Thr Leu Val Asp Pro Val

865

870

875

880

Arg Lys Thr Tyr Asn Ser Arg Ser Glu Cys Ser Ile Glu Phe Glu Val

885

890

895

Asp Gly Pro Tyr Lys Ala Met Ile Ile Pro Ala Ser Lys Glu Glu Gly

900

905

910

Ile Leu Ile Lys Lys Arg Tyr Ala Val Phe Asn His Asp Gly Thr Ile

915

920

925

Ala Glu Leu Lys Gly Phe Glu Met Lys Arg Arg Gly Glu Leu Lys Leu

930

935

940

Ile Lys Val Phe Gln Ala Glu Leu Phe Asp Lys Phe Leu His Gly Ser

945

950

955

960

Thr Leu Glu Glu Cys Tyr Ser Ala Val Ala Ala Val Ala Asn Arg Trp

965

970

975

Leu Asp Leu Leu Glu Gly Gln Gly Lys Asp Ile Ala Asp Ser Glu Leu

980

985

990

Leu Asp Tyr Ile Ser Glu Ser Ser Thr Met Ser Lys Ser Leu Ala Asp

995

1000

1005

58/236

Tyr Gly Gln Gln Lys Ser Cys Ala Val Thr Thr Ala Lys Arg Leu Ala
1010 1015 1020

Asp Phe Leu Gly Asp Thr Met Val Lys Asp Lys Gly Leu Arg Cys Gln
1025 1030 1035 1040

Tyr Ile Val Ala Arg Glu Pro Glu Gly Thr Pro Val Ser Glu Arg Ala
1045 1050 1055

Val Pro Val Ala Ile Phe Gln Thr Asp Asp Pro Glu Lys Lys Phe Tyr
1060 1065 1070

Leu Gln Lys Trp Cys Lys Ile Ser Ser Tyr Thr Gly Ile Arg Ser Ile
1075 1080 1085

Ile Asp Trp Met Tyr Tyr Lys Gln Arg Leu His Ser Ala Ile Gln Lys
1090 1095 1100

Val Ile Thr Ile Pro Ala Ala Met Gln Lys Val Ala Asn Pro Val Leu
1105 1110 1115 1120

Arg Val Arg His Pro Tyr Trp Leu Glu Lys Lys Val Cys Asp Lys Phe
1125 1130 1135

Arg Gln Gly Lys Ile Val Asp Met Phe Ser Ser Ala Asn Lys Asp His
1140 1145 1150

Ser Thr Thr Gln Asp Asn Val Val Ala Asp Ile Glu Glu Phe Cys Lys
1155 1160 1165

Glu Asn Arg Pro Ser Val Lys Gly Pro Lys Pro Val Ala Arg Ser Phe
1170 1175 1180

Glu Val Asp Arg Asn His Ser Glu Gly Lys Gln Gln Glu Ser Trp Asp
1185 1190 1195 1200

Pro Glu Phe His Asp Ile Ser Leu Gln Asn Val Asp Lys Asn Val Asp

59/236

1205	1210	1215
Tyr Gln Gly Trp Leu Glu Leu Glu Lys Arg Lys Trp Lys Met Thr Leu		
1220	1225	1230
Thr Asn Lys Lys Lys Arg Arg Phe Asp Asp Leu Lys Pro Cys Asn Gln		
1235	1240	1245
Ile Asp Ala His Lys Ile Asn Lys Lys Val Cys Lys Gly Arg Val Gly		
1250	1255	1260
Val Gly Ser Tyr Phe Arg Arg Pro Glu Glu Ala Leu Thr Ser Ser Tyr		
1265	1270	1275
1280		
Leu Gln Ile Ile Gln Leu Val Gln Ser Pro Gln Ser Gly Gln Phe Phe		
1285	1290	1295
Ala Trp Val Val Val Glu Gly Leu Met Leu Lys Ile Pro Leu Thr Ile		
1300	1305	1310
Pro Arg Val Phe Tyr Ile Asn Ser Lys Ala Ser Ile Ala Gly Asn Phe		
1315	1320	1325
Thr Gly Lys Cys Ile Asn Lys Ile Leu Pro His Gly Lys Pro Cys Tyr		
1330	1335	1340
Asn Leu Met Glu Ala Arg His Leu His Asn Thr His Ile Leu Leu Leu		
1345	1350	1355
1360		
Val Asn Ile Gln Glu Asp Gln Phe Ile Lys Glu Ser Lys Lys Leu Ala		
1365	1370	1375
Ala Leu Leu Ala Asp Pro Glu Ile Glu Gly Ile Tyr Glu Thr Lys Met		
1380	1385	1390
Pro Leu Glu Phe Ser Ala Ile Cys Gln Ile Gly Cys Val Cys Lys Ile		
1395	1400	1405

60/236

Glu Asp Thr Ala Lys His Arg Asn Thr Gln Asp Gly Trp Lys Leu Gly

1410

1415

1420

Glu Leu His Arg Ile Thr Thr Thr Glu Cys Arg Tyr Leu Glu Asn Ser

1425

1430

1435

1440

Ile Pro Leu Val Tyr Leu Tyr His Ser Thr Ser Thr Gly Arg Ala Val

1445

1450

1455

Tyr Val Leu Tyr Cys His Ala Ser Lys Leu Met Ser Val Val Val Val

1460

1465

1470

Asn Pro Tyr Gly Asp Lys Glu Leu Leu Ser Ser Ala Leu Glu Arg Gln

1475

1480

1485

Phe Arg Asp Arg Cys Gln Glu Leu Ser Pro Glu Pro Phe Ser Trp Asp

1490

1495

1500

Gly Ile Leu Phe Gln Val Glu Tyr Val Asp His Pro Glu Ala Ala Thr

1505

1510

1515

1520

Lys Phe Leu Gln Lys Ala Leu Cys Glu Tyr Arg Glu Glu Asn Cys Gly

1525

1530

1535

Ala Thr Val Ala Val Ile Glu Cys Pro Asp Phe Asn Thr Thr Lys Glu

1540

1545

1550

Gly Val Lys Ala Leu Glu Asp Phe Pro Cys Val Arg Ile Pro Phe Asn

1555

1560

1565

Asp Asp Asp Asn Ser Tyr Gln Pro Val Ser Trp Gln Arg Pro Ala Ala

1570

1575

1580

Lys Ile Ala Val Leu Arg Cys Ala Ser Ala Ile Gln Trp Leu Asp Arg

1585

1590

1595

1600

61/236

Arg Ile Ala Gln Ser Arg Tyr Ala His Val Pro Leu Gly Asn Phe Gly

1605

1610

1615

Arg Asp Trp Leu Thr Phe Thr Val Asp Ile Phe Leu Ser Arg Ala Leu

1620

1625

1630

Arg Asp Gln Gln Gln Val Leu Trp Val Ser Asp Asn Gly Val Pro Asp

1635

1640

1645

Leu Gly Asp Ile Asn Asn Glu Glu Thr Phe Leu Ala Asp Glu Leu Gln

1650

1655

1660

Glu Thr Ser Leu Leu Phe Pro Gly Ala Tyr Arg Lys Val Ser Val Glu

1665

1670

1675

1680

Leu Lys Val His Arg Leu Ala Val Asn Ala Leu Leu Lys Ser Asp Leu

1685

1690

1695

Val Ser Glu Met Glu Gly Gly Gly Phe Leu Gly Val Asn Ser Arg Gly

1700

1705

1710

Ser Ser Leu Asn Asp Asn Gly Ser Phe Asp Glu Asn Asn Gly Cys Ala

1715

1720

1725

Gln Ala Phe Arg Val Leu Lys Gln Leu Ile Lys Arg Leu Leu His Asp

1730

1735

1740

Ala Cys Asn Ser Gly Asn Ile Tyr Ala Asp Ser Ile Leu Gln His Leu

1745

1750

1755

1760

Ser Trp Trp Leu Arg Ser Pro Ser Ser Lys Leu His Asp Pro Ala Leu

1765

1770

1775

His Leu Met Leu His Lys Val Met Gln Lys Val Phe Ala Leu Leu Leu

1780

1785

1790

62/236

Thr Asp Leu Arg Arg Leu Gly Ala Ile Ile Ile Tyr Ala Asp Phe Ser
1795 1800 1805

Lys Val Ile Ile Asp Thr Gly Lys Phe Asp Leu Ser Ala Ala Lys Thr
1810 1815 1820

Tyr Cys Glu Ser Leu Leu Thr Val Met Gly Ser Arg Asp Ile Phe Lys
1825 1830 1835 1840

Leu Ile Leu Leu Glu Pro Val His Tyr Trp His Ser Leu Leu Phe Met
1845 1850 1855

Asp Gln His Asn Tyr Ala Gly Ile Arg Ala Thr Gly Asp Glu Ile Ser
1860 1865 1870

Gly Asn Glu Val Thr Ile Glu Pro Lys Trp Ser Val Ala Arg His Leu
1875 1880 1885

Pro Glu Tyr Ile Gln Lys Asp Phe Ile Ile Ile Val Ala Thr Phe Ile
1890 1895 1900

Phe Gly Pro Trp Lys Phe Ala Leu Glu Lys Lys Arg Gly Ser Ala Glu
1905 1910 1915 1920

Ser Leu Glu Ala Glu Met Val Glu Tyr Leu Lys Glu Gln Ile Gly Thr
1925 1930 1935

Arg Phe Ile Ser Met Ile Val Glu Lys Ile Gly Asn Ile Arg Ser His
1940 1945 1950

Ile Lys Asp Ile Asn Val Ser Asp Ala Ser Trp Ala Ser Gly Gln Ala
1955 1960 1965

Pro Lys Gly Asp Tyr Thr Phe Glu Phe Ile Gln Ile Ile Thr Ala Val
1970 1975 1980

Leu Ala Leu Asp Gln Asn Val Gln Gln Asp Val Leu Val Met Arg Lys

63/236

1985	1990	1995	2000
Ile Leu Leu Lys Tyr	Ile Lys Val Lys Glu Cys Ala Ala Glu Ala Glu		
2005	2010	2015	
Phe Ile Asp Pro Gly Pro Ser Phe Ile Leu Pro Asn Val Ala Cys Ser			
2020	2025	2030	
Asn Cys Gly Ala Tyr Arg Asp Leu Asp Phe Cys Arg Asp Ser Ala Leu			
2035	2040	2045	
Leu Thr Glu Lys Glu Trp Ser Cys Ala Asp Pro Gln Cys Val Lys Ile			
2050	2055	2060	
Tyr Asp Lys Glu Gln Ile Glu Ser Ser Ile Ile Gln Met Val Arg Gln			
2065	2070	2075	2080
Arg Glu Arg Met Tyr Gln Leu Gln Asp Leu Val Cys Asn Arg Cys Asn			
2085	2090	2095	
Gln Val Lys Ala Ala His Leu Thr Glu Gln Cys Glu Cys Ser Gly Ser			
2100	2105	2110	
Phe Arg Cys Lys Glu Ser Gly Ser Asp Phe His Lys Arg Ile Glu Ile			
2115	2120	2125	
Phe Leu Asp Ile Ala Lys Arg Gln Lys Phe Arg Leu Leu Glu Glu Cys			
2130	2135	2140	
Ile Ser Trp Ile Leu Phe Ala Thr Ser Cys			
2145	2150		

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<211> 3706

<212> DNA

<213> Oryza sativa

64/236

<400> 47

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65/236

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<210> 48

<211> 1105

<212> PRT

<213> Oryza sativa

<400> 48

Met Ser Ser Gly Gly Arg Gly Gly Lys Arg Arg Gly Ala Pro Pro Pro

1

5

10

15

66/236

Gly Pro Ser Gly Ala Ala Ala Lys Arg Ala His Pro Gly Gly Thr Pro

20

25

30

Gln Pro Pro Pro Pro Ala Ala Thr Ala Ala Ala Pro Val Ala Glu Glu

35

40

45

Glu Asp Met Met Asp Glu Asp Val Phe Leu Asp Glu Thr Ile Leu Ala

50

55

60

Glu Asp Glu Glu Ala Leu Leu Leu Leu Asp Arg Asp Glu Ala Leu Ala

65

70

75

80

Ser Arg Leu Ser Arg Trp Arg Arg Pro Ala Leu Pro Ala Asp Leu Ala

85

90

95

Ser Gly Cys Ser Arg Asn Val Ala Phe Gln Gln Leu Glu Ile Asp Tyr

100

105

110

Val Ile Gly Glu Ser His Lys Val Leu Leu Pro Asn Ser Ser Gly Pro

115

120

125

Ala Ala Ile Leu Arg Ile Phe Gly Val Thr Arg Glu Gly His Ser Val

130

135

140

Cys Cys Gln Val His Gly Phe Glu Pro Tyr Phe Tyr Ile Ser Cys Pro

145

150

155

160

Met Gly Met Gly Pro Asp Asp Ile Ser Arg Phe His Gln Thr Leu Glu

165

170

175

Gly Arg Met Lys Asp Ser Asn Arg Asn Ser Asn Val Pro Arg Phe Val

180

185

190

Lys Arg Ile Glu Leu Val Gln Lys Gln Thr Ile Met His Tyr Gln Pro

195

200

205

67/236

Gln Gln Ser Gln Pro Phe Leu Lys Ile Val Val Ala Leu Pro Thr Met
210 215 220

Val Ala Ser Cys Arg Gly Ile Leu Glu Arg Gly Ile Thr Ile Glu Gly
225 230 235 240

Leu Gly Ser Lys Ser Phe Leu Thr Tyr Glu Ser Asn Ile Leu Phe Ala
245 250 255

Leu Arg Phe Met Ile Asp Cys Asn Ile Val Gly Gly Asn Trp Ile Glu
260 265 270

Val Pro Ala Gly Lys Tyr Met Lys Ala Ala Arg Ile Met Ser Tyr Cys
275 280 285

Gln Leu Glu Leu Asp Cys Leu Tyr Ser Asp Leu Val Ser His Ala Ala
290 295 300

Glu Gly Glu His Ser Lys Met Ala Pro Phe Arg Ile Leu Ser Phe Asp
305 310 315 320

Ile Glu Cys Ala Gly Arg Lys Gly His Phe Pro Glu Pro Thr His Asp
325 330 335

Pro Val Ile Gln Ile Ala Asn Leu Val Thr Leu Gln Gly Glu Gly Gln
340 345 350

Pro Phe Val Arg Asn Val Met Thr Leu Lys Ser Cys Ser Pro Ile Val
355 360 365

Gly Val Asp Val Met Ser Phe Asp Thr Glu Arg Asp Val Leu Leu Ala
370 375 380

Trp Arg Asp Phe Ile Arg Glu Val Asp Pro Asp Ile Ile Ile Gly Tyr
385 390 395 400

Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu Ile Glu Arg Ala Glu Val

68/236

405	410	415
Leu Lys Ile Val Glu Phe Pro Ile Leu Gly Arg Ile Arg Asn Ser Arg		
420	425	430
Val Arg Val Arg Asp Thr Thr Phe Ser Ser Arg Gln Tyr Gly Met Arg		
435	440	445
Glu Ser Lys Asp Val Ala Val Glu Gly Arg Val Gln Phe Asp Leu Leu		
450	455	460
Gln Ala Met Gln Arg Asp Tyr Lys Leu Ser Ser Tyr Ser Leu Asn Ser		
465	470	475
Val Ser Ala His Phe Leu Gly Glu Gln Lys Glu Asp Val His His Ser		
485	490	495
Ile Ile Ser Asp Leu Gln Asn Gly Asn Ser Glu Thr Arg Arg Arg Leu		
500	505	510
Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu Pro Gln Arg Leu Leu Asp		
515	520	525
Lys Leu Met Tyr Ile Tyr Asn Tyr Val Glu Met Ala Arg Val Thr Gly		
530	535	540
Val Pro Ile Ser Phe Leu Leu Ser Arg Gly Gln Ser Ile Lys Val Leu		
545	550	555
Ser Gln Leu Leu Arg Lys Ala Lys Gln Lys Asn Leu Val Ile Pro Asn		
565	570	575
Ile Lys Gly Gln Ala Ser Gly Gln Asp Thr Phe Glu Gly Ala Thr Val		
580	585	590
Leu Glu Ala Arg Ala Gly Phe Tyr Glu Lys Pro Ile Ala Thr Leu Asp		

69/236

595	600	605	
Phe Ala Ser Leu Tyr Pro Ser Ile Met Met Ala Tyr Asn Leu Cys Tyr			
610	615	620	
Cys Thr Leu Val Pro Pro Glu Asp Ala Arg Lys Leu Asn Leu Pro Pro			
625	630	635	640
Glu Ser Val Asn Lys Thr Pro Ser Gly Glu Thr Phe Val Lys Pro Asp			
645	650	655	
Val Gln Lys Gly Ile Leu Pro Glu Ile Leu Glu Glu Leu Leu Ala Ala			
660	665	670	
Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu Ala Lys Asp Pro Phe Glu			
675	680	685	
Arg Ala Val Leu Asp Gly Arg Gln Leu Ala Leu Lys Ile Ser Ala Asn			
690	695	700	
Ser Val Tyr Gly Phe Thr Gly Ala Thr Val Gly Gln Leu Pro Cys Leu			
705	710	715	720
Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly Arg Gln Met Ile Glu His			
725	730	735	
Thr Lys Lys Leu Val Glu Asp Lys Phe Thr Thr Leu Gly Gly Tyr Glu			
740	745	750	
His Asn Ala Glu Val Ile Tyr Gly Asp Thr Asp Ser Val Met Val Gln			
755	760	765	
Phe Gly Val Ser Thr Val Glu Asp Ala Met Lys Leu Gly Arg Glu Ala			
770	775	780	
Ala Asp Tyr Ile Ser Gly Thr Phe Ile Lys Pro Ile Lys Leu Glu Phe			
785	790	795	800

70/236

Glu Lys Ile Tyr Phe Pro Tyr Leu Leu Ile Ser Lys Lys Arg Tyr Ala

805

810

815

Gly Leu Tyr Trp Thr Asn Pro Glu Lys Phe Asp Lys Met Asp Thr Lys

820

825

830

Gly Ile Glu Thr Val Arg Arg Asp Asn Cys Leu Leu Val Lys Asn Leu

835

840

845

Val Thr Glu Cys Leu His Lys Ile Leu Val Asp Arg Asp Val Pro Gly

850

855

860

Ala Val Gln Tyr Val Lys Asn Thr Ile Ser Asp Leu Leu Met Asn Arg

865

870

875

880

Val Asp Leu Ser Leu Leu Val Ile Thr Lys Gly Leu Thr Lys Thr Gly

885

890

895

Glu Asp Tyr Ala Val Lys Ala Ala His Val Glu Leu Ala Glu Arg Met

900

905

910

Arg Lys Arg Asp Ala Ala Thr Ala Pro Thr Val Gly Asp Arg Val Pro

915

920

925

Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala Lys Ala Tyr Glu Arg Ser

930

935

940

Glu Asp Pro Ile Tyr Val Leu Asp Asn Asn Ile Pro Ile Asp Pro Gln

945

950

955

960

Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro Leu Leu Arg Ile Phe Glu

965

970

975

Pro Ile Leu Lys Asn Ala Ser Arg Glu Leu Leu His Gly Ser His Thr

980

985

990

71/236

Arg Ala Val Ser Ile Ser Thr Pro Ser Asn Ser Gly Ile Met Lys Phe
 995 1000 1005

Ala Lys Lys Gln Leu Thr Cys Leu Gly Cys Lys Ala Val Ile Ser Gly
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Ser Asn Gln Thr Leu Cys Phe His Cys Lys Gly Arg Glu Ala Glu Leu
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Tyr Cys Lys Thr Val Gly Asn Val Ser Glu Leu Glu Met Leu Phe Gly
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Arg Leu Trp Thr Gln Cys Gln Glu Cys Gln Gly Ser Leu His Gln Asp
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Val Leu Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Arg Arg Arg Lys
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Phe
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<211> 3427

<212> DNA

<213> Glycine max

<400> 49

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72/236

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73/236

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 ttactg 3427

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<211> 1088

<212> PRT

<213> Glycine max

<400> 50

Met Thr Gln Glu Glu Glu Phe Met Asp Glu Asp Val Phe Ile Asn Glu

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15

Thr Leu Val Ser Glu Asp Glu Glu Ser Leu Ile Leu Arg Asp Ile Glu

20

25

30

Gln Arg Gln Ala Leu Ala Asn Arg Leu Ser Lys Trp Thr Arg Pro Pro

35

40

45

Leu Ser Ala Gly Tyr Val Ala Gln Ser Arg Ser Val Leu Phe Gln Gln

50

55

60

Leu Glu Ile Asp Tyr Val Ile Ala Glu Ser His Gly Glu Leu Leu Pro

74/236

65	70	75	80
Asn Ser Ser Gly Pro Val Ala Ile Ile Arg Ile Phe Gly Val Thr Lys			
	85	90	95
Glu Gly His Ser Val Cys Cys Asn Val His Gly Phe Glu Pro Tyr Phe			
100	105	110	
Tyr Ile Cys Cys Pro Pro Gly Met Gly Pro Asp Asp Ile Ser His Phe			
115	120	125	
His Gln Thr Leu Glu Gly Arg Met Arg Glu Ala Asn Arg Asn Ser Asn			
130	135	140	
Val Gly Lys Phe Val Arg Arg Ile Glu Met Val Gln Arg Arg Ser Ile			
145	150	155	160
Met Tyr Tyr Gln Gln Ser Asn Ser Gln Pro Phe Leu Lys Ile Val Val			
	165	170	175
Ala Leu Pro Thr Met Val Ala Ser Cys Arg Gly Ile Leu Asp Arg Gly			
180	185	190	
Ile Gln Leu Asp Gly Leu Gly Met Lys Ser Phe Leu Thr Tyr Glu Ser			
195	200	205	
Asn Val Leu Phe Ala Leu Arg Phe Met Ile Asp Cys Asn Ile Val Gly			
210	215	220	
Gly Asn Trp Ile Gly Ile Pro Ala Gly Lys Tyr Lys Lys Thr Ala Lys			
225	230	235	240
Ser Leu Ser Tyr Cys Gln Leu Glu Phe Asp Cys Leu Tyr Ser Glu Leu			
245	250	255	
Ile Ser His Ala Pro Glu Gly Glu Tyr Ser Lys Met Ala Pro Phe Arg			
260	265	270	

75/236

Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly His Phe Pro

275

280

285

Glu Pro Thr His Asp Pro Val Ile Gln Ile Ala Asn Leu Val Thr Leu

290

295

300

Gln Gly Glu Asp Gln Pro Phe Ile Arg Asn Val Met Thr Leu Lys Ser

305

310

315

320

Cys Ser Pro Ile Val Gly Val Asp Val Met Pro Phe Glu Thr Glu Arg

325

330

335

Glu Val Leu Leu Ala Trp Arg Asp Phe Ile Arg Glu Val Asp Pro Asp

340

345

350

Ile Ile Ile Gly Tyr Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu Ile

355

360

365

Glu Arg Ala Leu Asn Leu Lys Ile Ala Glu Phe Pro Ile Leu Gly Arg

370

375

380

Ile Arg Asn Ser Arg Val Arg Val Lys Asp Thr Thr Phe Ser Ser Arg

385

390

395

400

Gln Tyr Gly Thr Arg Glu Ser Lys Glu Val Ala Val Glu Gly Arg Val

405

410

415

Thr Phe Asp Leu Leu Gln Val Met Gln Arg Asp Tyr Lys Leu Ser Ser

420

425

430

Tyr Ser Leu Asn Ser Val Ser Ser His Phe Leu Ser Glu Gln Lys Glu

435

440

445

Asp Val His His Ser Ile Ile Ser Asp Leu Gln Asn Gly Asn Ala Glu

450

455

460

76/236

Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu Pro
465 470 475 480

Gln Arg Leu Leu Asp Lys Leu Met Phe Ile Tyr Asn Tyr Val Glu Met
485 490 495

Ala Arg Val Thr Gly Val Pro Ile Ser Phe Leu Leu Ser Arg Gly Gln
500 505 510

Ser Ile Lys Val Leu Ser Gln Leu Leu Arg Arg Ala Arg Gln Lys Asn
515 520 525

Leu Val Ile Pro Asn Ala Lys Gln Ala Gly Ser Glu Gln Gly Thr Phe
530 535 540

Glu Gly Ala Thr Val Leu Glu Ala Arg Ala Gly Phe Tyr Glu Lys Pro
545 550 555 560

Ile Ala Thr Leu Asp Phe Ala Ser Leu Tyr Pro Ser Ile Met Met Ala
565 570 575

Tyr Asn Leu Cys Tyr Cys Thr Leu Val Ile Pro Glu Asp Ala Arg Lys
580 585 590

Leu Asn Ile Pro Pro Glu Ser Val Asn Arg Thr Pro Ser Gly Glu Thr
595 600 605

Phe Val Lys Ser Asn Leu Gln Lys Gly Ile Leu Pro Glu Ile Leu Glu
610 615 620

Glu Leu Leu Thr Ala Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu Ala
625 630 635 640

Lys Asp Pro Leu Glu Lys Ala Val Leu Asp Gly Arg Gln Leu Ala Leu
645 650 655

77/236

Lys Ile Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala Thr Ile Gly
660 665 670

Gln Leu Pro Cys Leu Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly Arg
675 680 685

Gln Met Ile Glu His Thr Lys Lys Leu Val Glu Asp Lys Phe Thr Thr
690 695 700

Leu Asn Gly Tyr Glu His Asn Ala Glu Val Ile Tyr Gly Asp Thr Asp
705 710 715 720

Ser Val Met Val Gln Phe Gly Val Ser Ala Val Glu Glu Ala Met Asn
725 730 735

Leu Gly Arg Glu Ala Ala Glu His Ile Ser Gly Thr Phe Thr Lys Pro
740 745 750

Ile Lys Leu Glu Phe Glu Lys Val Tyr Tyr Pro Tyr Leu Leu Ile Ser
755 760 765

Lys Lys Arg Tyr Ala Gly Leu Phe Trp Thr Lys Pro Asp Asn Phe Asp
770 775 780

Lys Met Asp Thr Lys Gly Ile Glu Thr Val Arg Arg Asp Asn Cys Leu
785 790 795 800

Leu Val Lys Asn Leu Val Asn Asp Cys Leu His Lys Ile Leu Ile Asp
805 810 815

Arg Asp Ile Pro Gly Ala Val Gln Tyr Val Lys Asn Ala Ile Ser Asp
820 825 830

Leu Leu Met Asn Arg Met Asp Leu Ser Leu Leu Val Ile Thr Lys Gly
835 840 845

Leu Thr Lys Thr Gly Asp Asp Tyr Glu Val Lys Ala Ala His Val Glu

78/236

850	855	860
Leu Ala Glu Arg Met Arg Lys Arg Asp Ala Ala Thr Ala Pro Asn Val		
865	870	875 880
Gly Asp Arg Val Pro Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala Lys		
885	890	895
Ala Tyr Glu Arg Ser Glu Asp Pro Ile Tyr Val Leu Glu Asn Asn Ile		
900	905	910
Pro Ile Asp Pro His Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro Ile		
915	920	925
Leu Arg Ile Phe Glu Pro Ile Leu Lys Asn Ala Ser Lys Glu Leu Leu		
930	935	940
His Gly Ser His Thr Arg Ser Ile Ser Ile Ser Thr Pro Ser Asn Ser		
945	950	955 960
Gly Ile Leu Arg Phe Ala Lys Lys Gln Leu Pro Ala Leu Val Val Lys		
965	970	975
Leu Tyr Leu Ala Arg Val Ile Thr Leu Ser Val His Ile Ala Lys Glu		
980	985	990
Gly Arg Leu Ser Cys Thr Val Lys Gln Tyr Leu Lys Cys Leu Ser Trp		
995	1000	1005
Arg Cys Phe Leu Gly Gly Cys Gly His Ser Val Arg Ser Ala Lys Val		
1010	1015	1020
His Phe Ile Arg Met Phe Ser Ala Pro Val Gly Ile Val Gln Phe Ser		
1025	1030	1035 1040
Ile Asp Glu Lys Arg His Arg Lys Ile Trp Val Lys Gln Ser Cys Asn		
1045	1050	1055

79/236

Trp Thr Asp Gly Thr Ser Lys Phe Cys Gln Glu Phe Asp Leu Ala Asp

1060

1065

1070

Leu Phe Glu Pro Met Asp Thr Asn Thr Ile Trp Cys Leu Pro Gln Ser

1075

1080

1085

<210> 51

<211> 3435

<212> DNA

<213> Homo sapiens

<400> 51

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80/236

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81/236

tggacttttg ctaca

3435

<210> 52

<211> 1107

<212> PRT

<213> Homo sapiens

<400> 52

Met Asp Gly Lys Arg Arg Pro Gly Pro Gly Pro Gly Val Pro Pro Lys

1

5

10

15

Arg Ala Arg Gly Gly Leu Trp Asp Asp Asp Ala Pro Arg Pro Ser

20

25

30

Gln Phe Glu Glu Asp Leu Ala Leu Met Glu Glu Met Glu Ala Glu His

35

40

45

Arg Leu Gln Glu Gln Glu Glu Glu Leu Gln Ser Val Leu Glu Gly

50

55

60

Val Ala Asp Gly Gln Val Pro Pro Ser Ala Ile Asp Pro Arg Trp Leu

65

70

75

80

Arg Pro Thr Pro Pro Ala Leu Asp Pro Gln Thr Glu Pro Leu Ile Phe

85

90

95

Gln Gln Leu Glu Ile Asp His Tyr Val Gly Pro Ala Gln Pro Val Pro

100

105

110

Gly Gly Pro Pro Pro Ser His Gly Ser Val Pro Val Leu Arg Ala Phe

115

120

125

Gly Val Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile His Gly Phe

130

135

140

Ala Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Pro Glu His

82/236

145	150	155	160
Met Gly Asp Leu Gln Arg Glu Leu Asn Leu Ala Ile Asn Arg Asp Ser			
	165	170	175
Arg Gly Gly Arg Glu Leu Thr Gly Pro Ala Val Leu Ala Val Glu Leu			
	180	185	190
Cys Ser Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro			
	195	200	205
Phe Leu Arg Ile Thr Val Ala Leu Pro Arg Leu Val Ala Pro Ala Arg			
	210	215	220
Arg Leu Leu Glu Gln Gly Ile Arg Val Ala Gly Leu Gly Thr Pro Ser			
	225	230	235
Phe Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val			
	245	250	255
Asp Thr Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys			
	260	265	270
Tyr Ala Leu Arg Leu Lys Glu Lys Ala Thr Gln Cys Gln Leu Glu Ala			
	275	280	285
Asp Val Leu Trp Ser Asp Val Val Ser His Pro Pro Glu Gly Pro Trp			
	290	295	300
Gln Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala			
	305	310	315
Gly Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln			
	325	330	335
Ile Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg			
	340	345	350

83/236

Leu Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val

355

360

365

Gln Ser Tyr Glu Lys Glu Glu Asp Leu Leu Gln Ala Trp Ser Thr Phe

370

375

380

Ile Arg Ile Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn

385

390

395

400

Phe Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Gln

405

410

415

Thr Phe Pro Phe Leu Gly Arg Val Ala Gly Leu Cys Ser Asn Ile Arg

420

425

430

Asp Ser Ser Phe Gln Ser Lys Gln Thr Gly Arg Arg Asp Thr Lys Val

435

440

445

Val Ser Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu

450

455

460

Arg Glu Tyr Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His

465

470

475

480

Phe Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp

485

490

495

Leu Gln Asn Gly Asn Asp Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys

500

505

510

Leu Lys Asp Ala Tyr Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val

515

520

525

Leu Val Asn Ala Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Ser

530

535

540

84/236

Tyr Leu Leu Ser Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu
545 550 555 560

Arg Gln Ala Met His Glu Gly Leu Leu Met Pro Val Val Lys Ser Glu
565 570 575

Gly Gly Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly
580 585 590

Tyr Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro
595 600 605

Ser Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro
610 615 620

Gly Thr Ala Gln Lys Leu Gly Leu Thr Glu Asp Gln Phe Ile Arg Thr
625 630 635 640

Pro Thr Gly Asp Glu Phe Val Lys Thr Ser Val Arg Lys Gly Leu Leu
645 650 655

Pro Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala
660 665 670

Glu Leu Ala Lys Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly
675 680 685

Arg Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr
690 695 700

Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val
705 710 715 720

Thr Gly Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu
725 730 735

Ser Lys Tyr Thr Val Glu Asn Gly Tyr Ser Thr Ser Ala Lys Val Val

85/236

740	745	750
Tyr Gly Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val		
755	760	765
Ala Glu Ala Met Ala Leu Gly Gly Glu Ala Ala Asp Trp Val Ser Gly		
770	775	780
His Phe Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro		
785	790	800
Tyr Leu Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser		
805	810	815
Arg Pro Asp Ala His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val		
820	825	830
Arg Arg Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ala Ser Leu		
835	840	845
Arg Arg Leu Leu Ile Asp Arg Asp Pro Glu Gly Ala Val Ala His Ala		
850	855	860
Gln Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln		
865	870	875
Leu Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ser Asp Tyr Ala Gly		
885	890	895
Lys Gln Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro		
900	905	910
Gly Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Ser		
915	920	925
Ala Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe		
930	935	940

86/236

Val Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln
945 950 955 960

Gln Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu
965 970 975

Gly Arg Ala Glu Ala Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys
980 985 990

Thr Val Leu Thr Gly Lys Val Gly Gly Leu Leu Ala Phe Ala Lys Arg
995 1000 1005

Arg Asn Cys Cys Ile Gly Cys Arg Thr Val Leu Ser His Gln Gly Ala
1010 1015 1020

Val Cys Glu Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu
1025 1030 1035 1040

Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr
1045 1050 1055

Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr
1060 1065 1070

Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp
1075 1080 1085

Leu Glu Asp Gln Glu Gln Leu Leu Arg Arg Phe Gly Pro Pro Gly Pro
1090 1095 1100

Glu Ala Trp
1105

<210> 53

<211> 6912

87/236

<212> DNA

<213> Homo sapiens

<400> 53

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88/236

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89/236

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90/236

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<210> 54

<211> 2286

<212> PRT

<213> Homo sapiens

<400> 54

Met Ser Leu Arg Ser Gly Gly Arg Arg Arg Ala Asp Pro Gly Ala Asp

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Gly Glu Ala Ser Arg Asp Asp Gly Ala Thr Ser Ser Val Ser Ala Leu

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Lys Arg Leu Glu Arg Ser Gln Trp Thr Asp Lys Met Asp Leu Arg Phe

35 40 45

Gly Phe Glu Arg Leu Lys Glu Pro Gly Glu Lys Thr Gly Trp Leu Ile

50 55 60

Asn Met His Pro Thr Glu Ile Leu Asp Glu Asp Lys Arg Leu Gly Ser

65 70 75 80

Ala Val Asp Tyr Tyr Phe Ile Gln Asp Asp Gly Ser Arg Phe Lys Val

85 90 95

Ala Leu Pro Tyr Lys Pro Tyr Phe Tyr Ile Ala Thr Arg Lys Gly Cys

100 105 110

91/236

Glu Arg Glu Val Ser Ser Phe Leu Ser Lys Lys Phe Gln Gly Lys Ile

115

120

125

Ala Lys Val Glu Thr Val Pro Lys Glu Asp Leu Asp Leu Pro Asn His

130

135

140

Leu Val Gly Leu Lys Arg Asn Tyr Ile Arg Leu Ser Phe His Thr Val

145

150

155

160

Glu Asp Leu Val Lys Val Arg Lys Glu Ile Ser Pro Ala Val Lys Lys

165

170

175

Asn Arg Glu Gln Asp His Ala Ser Asp Ala Tyr Thr Ala Leu Leu Ser

180

185

190

Ser Val Leu Gln Arg Gly Gly Val Ile Thr Asp Glu Glu Glu Thr Ser

195

200

205

Lys Lys Ile Ala Asp Gln Leu Asp Asn Ile Val Asp Met Arg Glu Tyr

210

215

220

Asp Val Pro Tyr His Ile Arg Leu Ser Ile Asp Leu Lys Ile His Val

225

230

235

240

Ala His Trp Tyr Asn Val Arg Tyr Arg Gly Asn Ala Phe Pro Val Glu

245

250

255

Ile Thr Arg Arg Asp Asp Leu Val Glu Arg Pro Asp Pro Val Val Leu

260

265

270

Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala

275

280

285

Glu Thr Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly

290

295

300

92/236

Tyr Leu Ile Thr Asn Arg Glu Ile Val Ser Glu Asp Ile Glu Asp Phe
305 310 315 320

Glu Phe Thr Pro Lys Pro Glu Tyr Glu Gly Pro Phe Cys Val Phe Asn
325 330 335

Glu Pro Asp Glu Ala His Leu Ile Gln Arg Trp Phe Glu His Val Gln
340 345 350

Glu Thr Lys Pro Thr Ile Met Val Thr Tyr Asn Gly Asp Phe Phe Asp
355 360 365

Trp Pro Phe Val Glu Ala Arg Ala Ala Val His Gly Leu Ser Met Gln
370 375 380

Gln Glu Ile Gly Phe Gln Lys Asp Ser Gln Gly Glu Tyr Lys Ala Pro
385 390 395 400

Gln Cys Ile His Met Asp Cys Leu Arg Trp Val Lys Arg Asp Ser Tyr
405 410 415

Leu Pro Val Gly Ser His Asn Leu Lys Ala Ala Ala Lys Ala Lys Leu
420 425 430

Gly Tyr Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala
435 440 445

Thr Glu Gln Pro Gln Thr Leu Ala Thr Tyr Ser Val Ser Asp Ala Val
450 455 460

Ala Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ala
465 470 475 480

Leu Cys Thr Ile Ile Pro Met Glu Pro Asp Glu Val Leu Arg Lys Gly
485 490 495

Ser Gly Thr Leu Cys Glu Ala Leu Leu Met Val Gln Ala Phe His Ala

93/236

500	505	510
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515	520	525
Asp Asp Gly His Val Leu Asp Ser Glu Thr Tyr Val Gly Gly His Val		
530	535	540
Glu Ala Leu Glu Ser Gly Val Phe Arg Ser Asp Ile Pro Cys Arg Phe		
545	550	555 560
Arg Met Asn Pro Ala Ala Phe Asp Phe Leu Leu Gln Arg Val Glu Lys		
565	570	575
Thr Leu Arg His Ala Leu Glu Glu Glu Glu Lys Val Pro Val Glu Gln		
580	585	590
Val Thr Asn Phe Glu Glu Val Cys Asp Glu Ile Lys Ser Lys Leu Ala		
595	600	605
Ser Leu Lys Asp Val Pro Ser Arg Ile Glu Cys Pro Leu Ile Tyr His		
610	615	620
Leu Asp Val Gly Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu		
625	630	635 640
Gln Pro Ser Ala Met Val Asp Glu Ala Thr Cys Ala Ala Cys Asp Phe		
645	650	655
Asn Lys Pro Gly Ala Asn Cys Gln Arg Lys Met Ala Trp Gln Trp Arg		
660	665	670
Gly Glu Phe Met Pro Ala Ser Arg Ser Glu Tyr His Arg Ile Gln His		
675	680	685
Gln Leu Glu Ser Glu Lys Phe Pro Pro Leu Phe Pro Glu Gly Pro Ala		
690	695	700

94/236

Arg Ala Phe His Glu Leu Ser Arg Glu Glu Gln Ala Lys Tyr Glu Lys
705 710 715 720

Arg Arg Leu Ala Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Ile His Ile
725 730 735

Thr Lys Val Glu Glu Arg Leu Thr Thr Ile Cys Gln Arg Glu Asn Ser
740 745 750

Phe Tyr Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Phe
755 760 765

Lys Gly Leu His Lys Val Trp Lys Lys Lys Leu Ser Ala Ala Val Glu
770 775 780

Val Gly Asp Ala Ala Glu Val Lys Arg Cys Lys Asn Met Glu Val Leu
785 790 795 800

Tyr Asp Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr
805 810 815

Gly Tyr Val Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala
820 825 830

Gly Ile Val Cys Phe Thr Gly Ala Asn Ile Ile Thr Gln Ala Arg Glu
835 840 845

Leu Ile Glu Gln Ile Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile
850 855 860

Trp Cys Val Leu Pro Asn Ser Phe Pro Glu Asn Phe Val Phe Lys Thr
865 870 875 880

Thr Asn Val Lys Lys Pro Lys Val Thr Ile Ser Tyr Pro Gly Ala Met
885 890 895

95/236

Leu Asn Ile Met Val Lys Glu Gly Phe Thr Asn Asp Gln Tyr Gln Glu
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Leu Ala Glu Pro Ser Ser Leu Thr Tyr Val Thr Arg Ser Glu Asn Ser
915 920 925

Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met Ile Leu Pro Ala
930 935 940

Ser Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe Asn
945 950 955 960

Glu Asp Gly Ser Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg Arg
965 970 975

Gly Glu Leu Gln Leu Ile Lys Ile Phe Gln Ser Ser Val Phe Glu Ala
980 985 990

Phe Leu Lys Gly Ser Thr Leu Glu Glu Val Tyr Gly Ser Val Ala Lys
995 1000 1005

Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Lys Ala Ala Asn Met
1010 1015 1020

Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Arg Ser Met Ser
1025 1030 1035 1040

Arg Lys Leu Glu Asp Tyr Gly Glu Gln Lys Ser Thr Ser Ile Ser Thr
1045 1050 1055

Ala Lys Arg Leu Ala Glu Phe Leu Gly Asp Gln Met Val Lys Asp Ala
1060 1065 1070

Gly Leu Ser Cys Arg Tyr Ile Ile Ser Arg Lys Pro Glu Gly Ser Pro
1075 1080 1085

Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ala Glu Pro Thr

96/236

1090	1095	1100	
Val Arg Lys His Phe Leu Arg Lys Trp Leu Lys Ser Ser Ser Leu Gln			
1105	1110	1115	1120
Asp Phe Asp Ile Arg Ala Ile Leu Asp Trp Asp Tyr Tyr Ile Glu Arg			
	1125	1130	1135
Leu Gly Ser Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln			
	1140	1145	1150
Gln Val Lys Asn Pro Val Pro Arg Val Lys His Pro Asp Trp Leu His			
	1155	1160	1165
Lys Lys Leu Leu Glu Lys Asn Asp Val Tyr Lys Gln Lys Lys Ile Ser			
	1170	1175	1180
Glu Leu Phe Thr Leu Glu Gly Arg Arg Gln Val Thr Met Ala Glu Ala			
	1185	1190	1195
			1200
Ser Glu Asp Ser Pro Arg Pro Ser Ala Pro Asp Met Glu Asp Phe Gly			
	1205	1210	1215
Leu Val Lys Leu Pro His Pro Ala Ala Pro Val Thr Val Lys Arg Lys			
	1220	1225	1230
Arg Val Leu Trp Glu Ser Gln Glu Glu Ser Gln Asp Leu Thr Pro Thr			
	1235	1240	1245
Val Pro Trp Gln Glu Ile Leu Gly Gln Pro Pro Ala Leu Gly Thr Ser			
	1250	1255	1260
Gln Glu Glu Trp Leu Val Trp Leu Arg Phe His Lys Lys Lys Trp Gln			
	1265	1270	1275
			1280
Leu Gln Ala Arg Gln Arg Leu Ala Arg Arg Lys Arg Gln Arg Leu Glu			
	1285	1290	1295

97/236

Ser Ala Glu Gly Val Leu Arg Pro Gly Ala Ile Arg Asp Gly Pro Ala

1300

1305

1310

Thr Gly Leu Gly Ser Phe Leu Arg Arg Thr Ala Arg Ser Ile Leu Asp

1315

1320

1325

Leu Pro Trp Gln Ile Val Gln Ile Ser Glu Thr Ser Gln Ala Gly Leu

1330

1335

1340

Phe Arg Leu Trp Ala Leu Val Gly Ser Asp Leu His Cys Ile Arg Leu

1345

1350

1355

1360

Ser Ile Pro Arg Val Phe Tyr Val Asn Gln Arg Val Ala Lys Ala Glu

1365

1370

1375

Glu Gly Ala Ser Tyr Arg Lys Val Asn Arg Val Leu Pro Arg Ser Asn

1380

1385

1390

Met Val Tyr Asn Leu Tyr Glu Tyr Ser Val Pro Glu Asp Met Tyr Gln

1395

1400

1405

Glu His Ile Asn Glu Ile Asn Ala Glu Leu Ser Ala Pro Asp Ile Glu

1410

1415

1420

Gly Val Tyr Glu Thr Gln Val Pro Leu Leu Phe Arg Ala Leu Val His

1425

1430

1435

1440

Leu Gly Cys Val Cys Val Val Asn Lys Gln Leu Val Arg His Leu Ser

1445

1450

1455

Gly Trp Glu Ala Glu Thr Phe Ala Leu Glu His Leu Glu Met Arg Ser

1460

1465

1470

Leu Ala Gln Phe Ser Tyr Leu Glu Pro Gly Ser Ile Arg His Ile Tyr

1475

1480

1485

98/236

Leu Tyr His His Ala Gln Ala His Lys Ala Leu Phe Gly Ile Phe Ile
1490 1495 1500

Pro Ser Gln Arg Arg Ala Ser Val Phe Val Leu Asp Thr Val Arg Ser
1505 1510 1515 1520

Asn Gln Met Pro Ser Leu Gly Ala Leu Tyr Ser Ala Glu His Gly Leu
1525 1530 1535

Leu Leu Glu Lys Val Gly Pro Glu Leu Leu Pro Pro Pro Lys His Thr
1540 1545 1550

Phe Glu Val Arg Ala Glu Thr Asp Leu Lys Thr Ile Cys Arg Ala Ile
1555 1560 1565

Gln Arg Phe Leu Leu Ala Tyr Lys Glu Glu Arg Arg Gly Pro Thr Leu
1570 1575 1580

Ile Ala Val Gln Ser Ser Trp Glu Leu Lys Arg Leu Ala Ser Glu Ile
1585 1590 1595 1600

Pro Val Leu Glu Glu Phe Pro Leu Val Pro Ile Cys Val Ala Asp Lys
1605 1610 1615

Ile Asn Tyr Gly Val Leu Asp Trp Gln Arg His Gly Ala Arg Arg Met
1620 1625 1630

Ile Arg His Tyr Leu Asn Leu Asp Thr Cys Leu Ser Gln Ala Phe Glu
1635 1640 1645

Met Ser Arg Tyr Phe His Ile Pro Ile Gly Asn Leu Pro Glu Asp Ile
1650 1655 1660

Ser Thr Phe Gly Ser Asp Leu Phe Phe Ala Arg His Leu Gln Arg His
1665 1670 1675 1680

Asn His Leu Leu Trp Leu Ser Pro Thr Ala Arg Pro Asp Leu Gly Gly

99/236

1685	1690	1695
Lys Glu Ala Asp Asp Asn Cys Leu Val Met Glu Phe Asp Asp Gln Ala		
1700	1705	1710
Thr Val Glu Ile Asn Ser Ser Gly Cys Tyr Ser Thr Val Cys Val Glu		
1715	1720	1725
Leu Asp Leu Gln Asn Leu Ala Val Asn Thr Ile Leu Gln Ser His His		
1730	1735	1740
Val Asn Asp Met Glu Gly Ala Asp Ser Met Gly Ile Ser Phe Asp Val		
1745	1750	1755
Ile Gln Gln Ala Ser Leu Glu Asp Met Ile Thr Gly Gly Gln Ala Ala		
1765	1770	1775
Ser Ala Pro Ala Ser Tyr Asp Glu Thr Ala Leu Cys Ser Asn Thr Phe		
1780	1785	1790
Arg Ile Leu Lys Ser Met Val Val Gly Trp Val Lys Glu Ile Thr Gln		
1795	1800	1805
Tyr His Asn Ile Tyr Ala Asp Asn Gln Val Met His Phe Tyr Arg Trp		
1810	1815	1820
Leu Arg Ser Pro Ser Ser Leu Leu His Asp Pro Ala Leu His Arg Thr		
1825	1830	1835
Leu His Asn Met Met Lys Lys Leu Phe Leu Gln Leu Ile Ala Glu Phe		
1845	1850	1855
Lys Arg Leu Gly Ser Ser Val Ile Tyr Ala Asn Phe Asn Arg Ile Ile		
1860	1865	1870
Leu Cys Thr Lys Lys Arg Arg Val Glu Asp Ala Ile Ala Tyr Val Glu		
1875	1880	1885

100/236

Tyr Ile Thr Ser Ser Ile His Ser Lys Glu Thr Phe His Ser Leu Thr
1890 1895 1900

Ile Ser Phe Ser Arg Cys Trp Glu Phe Leu Leu Trp Met Asp Pro Ser
1905 1910 1915 1920

Asn Tyr Gly Gly Ile Lys Gly Lys Val Ser Ser Arg Ile His Cys Gly
1925 1930 1935

Leu Gln Asp Ser Gln Lys Ala Gly Gly Ala Glu Asp Glu Gln Glu Asn
1940 1945 1950

Glu Asp Asp Glu Glu Glu Arg Asp Gly Glu Glu Glu Glu Ala Glu
1955 1960 1965

Glu Ser Asn Val Glu Asp Leu Leu Glu Asn Asn Trp Asn Ile Leu Gln
1970 1975 1980

Phe Leu Pro Gln Ala Ala Ser Cys Gln Asn Tyr Phe Leu Met Ile Val
1985 1990 1995 2000

Ser Ala Tyr Ile Val Ala Val Tyr His Cys Met Lys Asp Gly Leu Arg
2005 2010 2015

Arg Ser Ala Pro Gly Ser Thr Pro Val Arg Arg Arg Gly Ala Ser Gln
2020 2025 2030

Leu Ser Gln Glu Ala Glu Gly Ala Val Gly Ala Leu Pro Gly Met Ile
2035 2040 2045

Thr Phe Ser Gln Asp Tyr Val Ala Asn Glu Leu Thr Gln Ser Phe Phe
2050 2055 2060

Thr Ile Thr Gln Lys Ile Gln Lys Lys Val Thr Gly Ser Arg Asn Ser
2065 2070 2075 2080

101/236

Thr Glu Leu Ser Glu Met Phe Pro Val Leu Pro Gly Ser His Leu Leu
2085 2090 2095

Leu Asn Asn Pro Ala Leu Glu Phe Ile Lys Tyr Val Cys Lys Val Leu
2100 2105 2110

Ser Leu Asp Thr Asn Ile Thr Asn Gln Val Asn Lys Leu Asn Arg Asp
2115 2120 2125

Leu Leu Arg Leu Val Asp Val Gly Glu Phe Ser Glu Glu Ala Gln Phe
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Arg Asp Pro Cys Arg Ser Tyr Val Leu Pro Glu Val Ile Cys Arg Ser
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Cys Asn Phe Cys Arg Asp Leu Asp Leu Cys Lys Asp Ser Ser Phe Ser
2165 2170 2175

Glu Asp Gly Ala Val Leu Pro Gln Trp Leu Cys Ser Asn Cys Gln Ala
2180 2185 2190

Pro Tyr Asp Ser Ser Ala Ile Glu Met Thr Leu Val Glu Val Leu Gln
2195 2200 2205

Lys Lys Leu Met Ala Phe Thr Leu Gln Asp Leu Val Cys Leu Lys Cys
2210 2215 2220

Arg Gly Val Lys Glu Thr Ser Met Pro Val Tyr Cys Thr Cys Ala Gly
2225 2230 2235 2240

Asp Phe Ala Leu Thr Ile His Thr Gln Val Phe Met Glu Gln Ile Gly
2245 2250 2255

Ile Phe Arg Asn Ile Ala Gln His Tyr Gly Met Ser Tyr Leu Leu Glu
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Thr Leu Glu Trp Leu Leu Gln Lys Asn Pro Gln Leu Gly His

102/236

2275

2280

2285

<210> 55

<211> 3390

<212> DNA

<213> Mus musculus

<400> 55

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103/236

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<210> 56

<211> 1105

<212> PRT

<213> Mus musculus

104/236

<400> 56

Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys

1 5 10 15

Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln

20 25 30

Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg

35 40 45

Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val

50 55 60

Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro

65 70 75 80

Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln

85 90 95

Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Arg

100 105 110

Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val

115 120 125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro

130 135 140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser

145 150 155 160

Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly

165 170 175

Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser

180 185 190

105/236

Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu
195 200 205

Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu
210 215 220

Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala
225 230 235 240

Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala
245 250 255

Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val
260 265 270

Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val
275 280 285

Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg
290 295 300

Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala
340 345 350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp

106/236

385	390	395	400
Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe			
405	410	415	
Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser			
420	425	430	
Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser			
435	440	445	
Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu			
450	455	460	
His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu			
465	470	475	480
Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln			
485	490	495	
Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys			
500	505	510	
Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val			
515	520	525	
Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu			
530	535	540	
Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln			
545	550	555	560
Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Gly			
565	570	575	
Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr			
580	585	590	

107/236

Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile

595

600

605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala

610

615

620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr

625

630

635

640

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln

645

650

655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu

660

665

670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln

675

680

685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala

690

695

700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly

705

710

715

720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys

725

730

735

Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly

740

745

750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu

755

760

765

Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe

770

775

780

108/236

Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu
785 790 795 800

Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser
805 810 815

Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg
820 825 830

Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
835 840 845

Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
865 870 875 880

Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln
885 890 895

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
900 905 910

Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu
930 935 940

Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu
945 950 955 960

Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg
965 970 975

Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val

109/236

980	985	990
Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn		
995	1000	1005
Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val Cys		
1010	1015	1020
Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Ser Gln Lys Glu Val Ser		
1025	1030	1035
		1040
His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln Cys		
1045	1050	1055
Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser Arg		
1060	1065	1070
Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp Leu Glu		
1075	1080	1085
Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly Pro Pro Gly Pro Glu Ala		
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Trp		
1105		

<210> 57

<211> 7119

<212> DNA

<213> Mus musculus

<400> 57

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110/236

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111/236

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112/236

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113/236

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<211> 2284

<212> PRT

<213> Mus musculus

<400> 58

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1 5 10 15

Gly Glu Gly Ser Arg Asp Asp Gly Pro Ser Ser Ser Val Ser Ala Leu
20 25 30

Lys Arg Leu Glu Arg Ser Gln Trp Thr Asp Lys Met Asp Leu Arg Phe
35 40 45

Gly Phe Glu Arg Leu Lys Glu Pro Gly Glu Arg Thr Gly Trp Leu Ile
50 55 60

Asn Met His Pro Thr Glu Ile Leu Asp Glu Asp Lys Arg Leu Val Ser
65 70 75 80

Ala Val Asp Tyr Tyr Phe Ile Gln Asp Asp Gly Ser Arg Phe Lys Val
85 90 95

Ala Leu Pro Tyr Met Pro Tyr Phe Tyr Ile Ala Ala Arg Lys Gly Cys
100 105 110

Asp Arg Glu Val Ser Ser Phe Leu Ser Lys Lys Phe Gln Gly Lys Ile
115 120 125

Ala Lys Leu Glu Asn Val Pro Lys Glu Asp Leu Asp Leu Pro Asn His

114/236

130	135	140	
Leu Val Gly Leu Lys Arg Ser Tyr Ile Lys Leu Ser Phe His Thr Val			
145	150	155	160
Glu Asp Leu Val Lys Val Arg Lys Glu Ile Ser Pro Ala Val Lys Lys			
	165	170	175
Asn Arg Glu Gln Asp His Ala Ser Asp Glu Tyr Thr Thr Met Leu Ser			
	180	185	190
Ser Ile Leu Gln Gly Gly Ser Val Ile Thr Asp Glu Glu Glu Thr Ser			
	195	200	205
Lys Lys Ile Ala Asp Gln Leu Asp Asn Ile Val Asp Met Arg Glu Tyr			
	210	215	220
Asp Val Pro Tyr His Ile Arg Leu Ser Ile Asp Leu Arg Ile His Val			
225	230	235	240
Ala His Trp Tyr Asn Val Arg Phe Arg Gly Asn Ala Phe Pro Val Glu			
	245	250	255
Ile Thr Arg Arg Asp Asp Leu Val Glu Arg Pro Asp Pro Val Val Leu			
	260	265	270
Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala			
	275	280	285
Glu Thr Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly			
	290	295	300
Tyr Leu Ile Thr Asn Arg Glu Ile Val Ser Glu Asp Ile Glu Asp Phe			
305	310	315	320
Glu Phe Thr Pro Lys Pro Glu Tyr Glu Gly Pro Phe Cys Val Phe Asn			
	325	330	335

115/236

Glu Pro Asp Glu Val His Leu Ile Gln Arg Trp Phe Glu His Ile Gln

340

345

350

Glu Thr Lys Pro Thr Ile Met Val Thr Tyr Asn Gly Asp Phe Phe Asp

355

360

365

Trp Pro Phe Val Glu Ala Arg Ala Ala Ile His Gly Leu Ser Met Tyr

370

375

380

Gln Glu Ile Gly Phe Gln Lys Asp Ser Gln Gly Glu Tyr Lys Ala Pro

385

390

395

400

Gln Cys Ile His Met Asp Cys Leu Arg Trp Val Lys Arg Asp Ser Tyr

405

410

415

Leu Pro Val Gly Ser His Asn Leu Lys Ala Ala Ala Lys Ala Lys Leu

420

425

430

Gly Tyr Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala

435

440

445

Thr Glu Gln Pro Gln Thr Leu Ala Thr Tyr Ser Val Ser Asp Ala Val

450

455

460

Ala Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ala

465

470

475

480

Leu Cys Thr Ile Ile Pro Met Glu Pro Asp Glu Val Leu Arg Lys Gly

485

490

495

Ser Gly Thr Leu Cys Glu Ala Leu Leu Met Val Gln Ala Phe His Ala

500

505

510

Asn Ile Ile Phe Pro Asn Lys Gln Glu Gln Glu Phe Asn Lys Leu Thr

515

520

525

116/236

Asp Asp Gly His Val Leu Asp Ala Glu Thr Tyr Val Gly Gly His Val
530 535 540

Glu Ala Leu Glu Ser Gly Val Phe Arg Ser Asp Ile Pro Cys Arg Phe
545 550 555 560

Arg Met Asn Pro Ala Ala Phe Asp Phe Leu Leu Gln Arg Val Glu Lys
565 570 575

Thr Met Arg His Ala Ile Glu Glu Glu Glu Lys Val Pro Val Glu Gln
580 585 590

Ala Thr Asn Phe Gln Glu Val Cys Glu Gln Ile Lys Thr Lys Leu Thr
595 600 605

Ser Leu Lys Asp Val Pro Asn Arg Ile Glu Cys Pro Leu Ile Tyr His
610 615 620

Leu Asp Val Gly Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu
625 630 635 640

Gln Pro Ser Ala Ile Val Asp Glu Ala Thr Cys Ala Ala Cys Asp Phe
645 650 655

Asn Lys Pro Gly Ala Ser Cys Gln Arg Lys Met Ala Trp Gln Trp Arg
660 665 670

Gly Glu Phe Met Pro Ala Ser Arg Ser Glu Tyr His Arg Ile Gln His
675 680 685

Gln Leu Glu Ser Glu Lys Phe Pro Pro Leu Phe Pro Glu Gly Pro Ala
690 695 700

Arg Ala Phe His Glu Leu Ser Arg Glu Glu Gln Ala Lys Tyr Glu Lys
705 710 715 720

Arg Arg Leu Ala Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Ile His Val

117/236

725	730	735
Thr Lys Val Glu Glu Arg Leu Thr Thr Ile Cys Gln Arg Glu Asn Ser		
740	745	750
Phe Tyr Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Phe		
755	760	765
Lys Gly Leu His Lys Val Trp Lys Lys Lys Leu Ser Ala Ala Val Glu		
770	775	780
Val Gly Asp Ala Ser Glu Val Lys Arg Cys Lys Asn Met Glu Ile Leu		
785	790	795
Tyr Asp Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr		
805	810	815
Gly Tyr Val Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala		
820	825	830
Gly Ile Val Cys Phe Thr Gly Ala Asn Ile Ile Thr Gln Ala Arg Glu		
835	840	845
Leu Ile Glu Gln Ile Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile		
850	855	860
Trp Cys Val Leu Pro Asn Ser Phe Pro Glu Asn Phe Val Ile Lys Thr		
865	870	875
Thr Asn Ala Lys Lys Pro Lys Leu Thr Ile Ser Tyr Pro Gly Ala Met		
885	890	895
Leu Asn Ile Met Val Lys Glu Gly Phe Thr Asn His Gln Tyr Gln Glu		
900	905	910
Leu Thr Glu Pro Ser Ser Leu Thr Tyr Val Thr His Ser Glu Asn Ser		

118/236

915	920	925	
Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met, Ile Leu Pro Ala			
930	935	940	
Ser Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe Asn			
945	950	955	960
Glu Asp Gly Ser Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg Arg			
965	970	975	
Gly Glu Leu Gln Leu Ile Lys Ile Phe Gln Ser Ser Val Phe Glu Ala			
980	985	990	
Phe Leu Lys Gly Ser Thr Leu Glu Glu Val Tyr Gly Ser Val Ala Lys			
995	1000	1005	
Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Lys Ala Ala Asn Met			
1010	1015	1020	
Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Arg Ser Met Ser			
1025	1030	1035	1040
Arg Lys Leu Glu Asp Tyr Gly Glu Gln Lys Ser Thr Ser Ile Ser Thr			
1045	1050	1055	
Ala Lys Arg Leu Ala Glu Phe Leu Gly Asp Gln Met Val Lys Asp Ala			
1060	1065	1070	
Gly Leu Ser Cys Arg Tyr Ile Ile Ser Arg Lys Pro Glu Gly Ser Pro			
1075	1080	1085	
Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ala Glu Pro Thr			
1090	1095	1100	
Val Arg Lys His Phe Leu Arg Lys Trp Leu Lys Ser Ser Ser Leu Gln			
1105	1110	1115	1120

119/236

Asp Phe Asp Ile Arg Thr Ile Leu Asp Trp Asp Tyr Tyr Ile Glu Arg
1125 1130 1135

Leu Gly Ser Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln
1140 1145 1150

Gln Val Lys Asn Pro Val Pro Arg Val Lys His Pro Asp Trp Leu His
1155 1160 1165

Lys Lys Leu Leu Glu Lys Asn Asp Ile Tyr Lys Gln Lys Lys Ile Ser
1170 1175 1180

Glu Leu Phe Val Leu Glu Gly Lys Arg Gln Ile Val Met Ala Gln Ala
1185 1190 1195 1200

Ser Glu Asn Ser Leu Ser Leu Cys Thr Pro Asp Met Glu Asp Ile Gly
1205 1210 1215

Leu Thr Lys Pro His His Ser Thr Val Pro Val Ala Thr Lys Arg Lys
1220 1225 1230

Arg Val Trp Glu Thr Gln Lys Glu Ser Gln Asp Ile Ala Leu Thr Val
1235 1240 1245

Pro Trp Gln Glu Val Leu Gly Gln Pro Pro Ser Leu Gly Thr Thr Gln
1250 1255 1260

Glu Glu Trp Leu Val Trp Leu Gln Phe His Lys Lys Lys Trp Gln Leu
1265 1270 1275 1280

Gln Ala Gln Gln Arg Leu Ala Leu Arg Lys Lys Gln Arg Leu Glu Ser
1285 1290 1295

Ala Glu Asp Met Pro Arg Leu Gly Pro Ile Arg Glu Glu Pro Ser Thr
1300 1305 1310

120/236

Gly Leu Gly Ser Phe Leu Arg Arg Thr Ala Arg Ser Ile Met Asp Leu

1315

1320

1325

Pro Trp Gln Ile Ile Gln Ile Ser Glu Thr Arg Gln Ala Gly Leu Phe

1330

1335

1340

Arg Leu Trp Ala Ile Ile Gly Asn Asp Leu His Cys Ile Lys Leu Ser

1345

1350

1355

1360

Ile Pro Arg Val Phe Tyr Val Asn Gln Arg Val Ala Lys Ala Glu Asp

1365

1370

1375

Gly Pro Ala Tyr Arg Lys Val Asn Arg Gly Leu Phe Leu Arg Ser Asn

1380

1385

1390

Ile Val Tyr Asn Leu Tyr Glu Tyr Ser Val Pro Glu Asp Met Tyr Gln

1395

1400

1405

Glu His Ile Asn Glu Ile Asn Thr Glu Leu Ser Val Pro Asp Ile Glu

1410

1415

1420

Gly Val Tyr Glu Thr Gln Val Pro Leu Leu Phe Arg Ala Leu Val Gln

1425

1430

1435

1440

Leu Gly Cys Val Cys Val Val Asn Lys Gln Leu Thr Arg His Leu Ser

1445

1450

1455

Gly Trp Glu Ala Glu Thr Phe Ala Leu Glu His Leu Glu Met Arg Ser

1460

1465

1470

Leu Ala Gln Phe Ser Tyr Leu Glu Pro Gly Ser Ile Arg His Ile Tyr

1475

1480

1485

Leu Tyr His His Thr Gln Gly His Lys Ala Leu Phe Gly Val Phe Ile

1490

1495

1500

121/236

Pro Ser Gln Arg Arg Ala Ser Val Phe Val Leu Asp Thr Val Arg Ser
1505 1510 1515 1520

Asn Gln Met Pro Gly Leu Ser Ala Leu Tyr Ser Ser Glu His Ser Leu
1525 1530 1535

Leu Leu Asp Lys Val Asp Pro Lys Leu Leu Pro Pro Pro Lys His Thr
1540 1545 1550

Phe Glu Val Arg Ala Glu Thr Asn Leu Glu Thr Ile Cys Arg Ala Ile
1555 1560 1565

Gln Arg Phe Leu Leu Ala Tyr Lys Glu Glu Arg Arg Gly Pro Thr Leu
1570 1575 1580

Ile Ala Val Gln Ser Ser Trp Glu Leu Cys Arg Leu Thr Ser Glu Ile
1585 1590 1595 1600

Pro Val Leu Glu Glu Phe Pro Leu Val Pro Ile Arg Val Ala Asp Lys
1605 1610 1615

Ile Ser Tyr Ala Val Leu Asp Trp Gln Arg His Gly Ala Arg Arg Met
1620 1625 1630

Ile Arg His Tyr Leu Asn Leu Asp Leu Cys Leu Ser Gln Ala Phe Glu
1635 1640 1645

Met Ser Arg Tyr Phe His Ile Pro Val Gly Asn Leu Pro Glu Asp Ile
1650 1655 1660

Ser Ile Phe Gly Ser Asp Leu Phe Phe Ala Arg His Leu Gln His His
1665 1670 1675 1680

Asn His Leu Leu Trp Leu Ser Pro Thr Ser Arg Pro Asp Leu Gly Gly
1685 1690 1695

Lys Glu Ala Asp Asp Asn Arg Leu Val Met Glu Phe Asp Asp Arg Ala

122/236

1700	1705	1710	
Thr Val Glu Ile Asn Ser Ser Gly Cys Tyr Ser Thr Val Cys Val Glu			
1715	1720	1725	
Leu Asp Ile Gln Asn Leu Ala Val Asn Thr Ile Leu Gln Ser His His			
1730	1735	1740	
Val Asn Asp Met Glu Gly Ala Gly Ser Met Gly Ile Ser Phe Asp Val			
1745	1750	1755	1760
Ile Gln Gln Ala Ser Leu Glu Asp Met Val Thr Gly Asn Gln Ala Ala			
1765	1770	1775	
Ser Ala Leu Ala Asn Tyr Asp Glu Thr Ala Leu Cys Ser Ser Thr Phe			
1780	1785	1790	
Arg Ile Leu Lys Ser Met Val Val Gly Trp Val Lys Glu Ile Thr Gln			
1795	1800	1805	
Tyr His Asn Ile Tyr Ala Asp Asn Gln Val Met His Phe Tyr Arg Trp			
1810	1815	1820	
Leu Gln Ser Pro Cys Ser Leu Leu His Asp Pro Ala Leu His Arg Thr			
1825	1830	1835	1840
Leu His Asn Met Met Lys Lys Leu Phe Leu Gln Leu Ile Ala Glu Phe			
1845	1850	1855	
Lys Arg Leu Gly Ser Ser Val Val Tyr Ala Asn Phe Asn Arg Ile Ile			
1860	1865	1870	
Leu Cys Thr Lys Lys Arg Arg Ile Glu Asp Ala Leu Ala Tyr Val Glu			
1875	1880	1885	
Tyr Ile Thr Asn Ser Ile His Ser Lys Glu Ile Phe His Ser Leu Thr			
1890	1895	1900	

123/236

Ile Ser Phe Ser Arg Cys Trp Glu Phe Leu Leu Trp Met Asp Pro Ser
 1905 1910 1915 1920

Asn Tyr Gly Gly Ile Lys Gly Lys Val Pro Ser Ser Ile His Cys Gly
 1925 1930 1935

Gln Val Lys Glu Gln Asp Ser Gln Ala Arg Glu Glu Thr Asp Glu Glu
 1940 1945 1950

Glu Glu Asp Lys Glu Lys Asp Glu Glu Glu Glu Gly Met Gly Glu Ser
 1955 1960 1965

Glu Val Glu Asp Leu Leu Glu Asn Asn Trp Asn Ile Leu Gln Phe Leu
 1970 1975 1980

Pro Gln Ala Ala Ser Cys Gln Ser Tyr Phe Leu Met Ile Val Ser Ala
 1985 1990 1995 2000

Tyr Ile Val Ala Val Tyr Gln Ser Met Lys Glu Glu Leu Arg His Ser
 2005 2010 2015

Ala Pro Gly Ser Thr Pro Val Lys Arg Lys Gly Ala Ser Gln Phe Ser
 2020 2025 2030

Gln Glu Ser Glu Gly Ala Thr Gly Ser Leu Pro Gly Met Ile Thr Phe
 2035 2040 2045

Ser Gln Asp Tyr Val Ala Asn Glu Leu Thr Gln Ser Phe Phe Thr Ile
 2050 2055 2060

Thr Gln Lys Ile Gln Lys Lys Val Thr Gly Ser Arg Asn Thr Thr Glu
 2065 2070 2075 2080

Pro Ser Glu Met Phe Pro Val Leu Pro Gly Ser His Leu Leu Leu Asn
 2085 2090 2095

124/236

Asn Pro Ala Leu Glu Phe Ile Lys Tyr Val Cys Lys Val Leu Ser Gln
2100 2105 2110

Asp Thr Asn Ile Thr Asn Gln Val Asn Lys Leu Asn Arg Asp Leu Leu
2115 2120 2125

Arg Leu Val Asp Val Gly Glu Phe Ser Glu Glu Ala Gln Phe Arg Asp
2130 2135 2140

Pro Cys His Ser Tyr Val Leu Pro Glu Val Ile Cys His Ser Cys Asn
2145 2150 2155 2160

Phe Cys Arg Asp Leu Asp Leu Cys Lys Asp Ser Ser Phe Ser Gln Asp
2165 2170 2175

Gly Ala Ile Leu Pro Gln Trp Leu Cys Ser Asn Cys Gln Ala Pro Tyr
2180 2185 2190

Asp Ser Ser Ala Ile Glu Ser Ala Leu Val Glu Ala Leu Gln Arg Lys
2195 2200 2205

Leu Met Ala Phe Thr Leu Gln Asp Leu Val Cys Leu Lys Cys Arg Gly
2210 2215 2220

Met Lys Glu Thr His Met Pro Val Tyr Cys Ser Cys Ala Gly Asp Phe
2225 2230 2235 2240

Thr Leu Thr Ile Arg Thr Glu Val Phe Met Glu Gln Ile Arg Ile Phe
2245 2250 2255

Gln Asn Ile Ala Lys Tyr Tyr Ser Met Ser Tyr Leu Gln Glu Thr Ile
2260 2265 2270

Glu Trp Leu Leu Gln Thr Ser Pro Val Ser Asn Cys
2275 2280

125/236

<210> 59

<211> 3325

<212> DNA

<213> Rattus norvegicus

<400> 59

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126/236

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<210> 60

<211> 1103

<212> PRT

<213> Rattus norvegicus

<400> 60

Met Asp Gly Lys Arg Arg Gln Ala Pro Ser Ser Gly Val Pro Pro Lys

1

5

10

15

Arg Ala Cys Lys Gly Leu Trp Asp Glu Asp Glu Pro Ser Gln Phe Glu

127/236

20	25	30
Glu Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg Leu Gln		
35	40	45
Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Ile Val Gly Gly		
50	55	60
Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Leu Arg Pro Thr Pro		
65	70	75
Leu Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln Leu Glu		
85	90	95
Ile Asp His Tyr Val Gly Thr Ser Pro Pro Leu Pro Glu Gly Pro Pro		
100	105	110
Ala Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val Thr Asp		
115	120	125
Glu Gly Phe Ser Val Cys Cys His Ile His Gly Phe Ala Pro Tyr Phe		
130	135	140
Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser Glu Leu		
145	150	155
Gln Arg Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly Gly Lys		
165	170	175
Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser Arg Glu		
180	185	190
Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu Arg Ile		
195	200	205
Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu Leu Glu		
210	215	220

128/236

Gln Gly Ile Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala Pro Tyr
225 230 235 240

Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala Asp Ile
245 250 255

Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val Arg Arg
260 265 270

Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val Leu Trp
275 280 285

Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg Ile Ala
290 295 300

Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly
305 310 315 320

Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys Ser Leu
325 330 335

Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala Leu Thr
340 345 350

Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser Tyr Glu
355 360 365

Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Thr Phe Ile Leu Ala Met
370 375 380

Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp Leu Pro
385 390 395 400

Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Asp Arg Phe Pro Phe
405 410 415

129/236

Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser Ser Phe
420 425 430

Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Val Ser Met Val
435 440 445

Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu Tyr Lys
450 455 460

Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu Gly Glu
465 470 475 480

Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln Asn Gly
485 490 495

Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala
500 505 510

Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val Asn Asn
515 520 525

Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu Leu Ser
530 535 540

Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln Ala Met
545 550 555 560

Arg Glu Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Gly Glu Asp
565 570 575

Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr Asp Val
580 585 590

Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile Met Met
595 600 605

Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala Ala Gln

130/236

610	615	620	
Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr Gly Asp			
625	630	635	640
Glu Phe Val Lys Ala Ser Val Arg Lys Gly Leu Leu Pro Gln Ile Leu			
645	650	655	
Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu Ala Gln			
660	665	670	
Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln Leu Ala			
675	680	685	
Leu Lys Val Ser Pro Asn Ser Val Tyr Gly Phe Thr Gly Ala Gln Val			
690	695	700	
Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly Phe Gly			
705	710	715	720
Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Thr Lys Tyr Thr			
725	730	735	
Leu Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly Asp Thr			
740	745	750	
Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu Ala Met			
755	760	765	
Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe Pro Ser			
770	775	780	
Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu Leu Ile			
785	790	795	800
Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser Asp Ala			
805	810	815	

131/236

His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg Asp Asn
820 825 830

Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg Ile Leu
835 840 845

Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp Val Ile
850 855 860

Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val Ile Thr
865 870 875 880

Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln Ala His
885 890 895

Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser Ala Pro
900 905 910

Asn Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala Lys Gly
915 920 925

Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu Glu His
930 935 940

Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu Ala Lys
945 950 955 960

Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg Ala Glu
965 970 975

Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val Leu Thr
980 985 990

Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn Ser Cys
995 1000 1005

132/236

Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val Cys Lys Phe
 1010 1015 1020

Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu Val Ser His Leu
 1025 1030 1035 1040

Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln Cys Gln Arg
 1045 1050 1055

Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser Arg Asp Cys
 1060 1065 1070

Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp Leu Glu Asp Gln
 1075 1080 1085

Glu Arg Leu Leu Gln Arg Phe Gly Pro Pro Gly Pro Glu Ala Trp
 1090 1095 1100

<210> 61

<211> 3451

<212> DNA

<213> Bos taurus

<400> 61

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 agatggaagc agagcgagg ctgcaggagc aggaggagga ggagctgcag tcggccctgg 240
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133/236

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134/236

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 gacggggaat taataaagct caggcctttt g 3451

<210> 62

<211> 1106

<212> PRT

<213> Bos taurus

<400> 62

Met Asp Gly Lys Arg Arg Pro Gly Pro Gly Pro Gly Val Pro Pro Lys

1	5	10	15
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Arg Ala Arg Gly Gly Leu Trp Asp Glu Asp Glu Ala Tyr Arg Pro Ser

20	25	30
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Gln Phe Glu Glu Glu Leu Ala Leu Met Glu Glu Met Glu Ala Glu Arg

35	40	45
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Arg Leu Gln Glu Gln Glu Glu Glu Leu Gln Ser Ala Leu Glu Ala

50	55	60
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Ala Asp Gly Gln Phe Ser Pro Thr Ala Ile Asp Ala Arg Trp Leu Arg

65	70	75	80
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Pro Ala Pro Pro Ala Leu Asp Pro Gln Met Glu Pro Leu Ile Phe Gln

85	90	95
----	----	----

Gln Leu Glu Ile Asp His Tyr Val Ala Pro Ala Arg Pro Leu Pro Gly

135/236

100	105	110	
Ala Pro Pro Pro Ser Gln Asp Ser Val Pro Ile Leu Arg Ala Phe Gly			
115	120	125	
Val Thr Asn Glu Gly Val Ser Val Cys Cys His Ile His Gly Phe Ala			
130	135	140	
Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Pro Glu His Leu			
145	150	155	160
Ser Glu Leu Gln Arg Glu Leu Ser Ala Ala Ile Ser Arg Asp Gln Arg			
165	170	175	
Gly Gly Lys Glu Leu Thr Gly Pro Ala Val Leu Ala Val Glu Leu Cys			
180	185	190	
Ser Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe			
195	200	205	
Leu Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg			
210	215	220	
Leu Leu Glu Gln Gly Ile Arg Leu Ala Gly Leu Gly Thr Pro Ser Phe			
225	230	235	240
Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp			
245	250	255	
Thr Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr			
260	265	270	
Ile Leu Arg Pro Glu Gly Lys Ala Thr Leu Cys Gln Leu Glu Ala Asp			
275	280	285	
Val Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Glu Trp Gln			
290	295	300	

136/236

Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly
305 310 315 320

Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile
325 330 335

Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu
340 345 350

Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln
355 360 365

Ser Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ser Thr Phe Ile
370 375 380

Arg Ile Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe
385 390 395 400

Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Pro Gly
405 410 415

Phe Pro Leu Leu Gly Arg Val Ile Gly Leu Arg Ser Asn Ile Arg Glu
420 425 430

Ser Ser Phe Gln Ser Arg Gln Thr Gly Arg Arg Asp Ser Lys Val Val
435 440 445

Ser Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg
450 455 460

Glu Tyr Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe
465 470 475 480

Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu
485 490 495

137/236

Gln Asn Gly Asn Asp Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu
500 505 510

Lys Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu
515 520 525

Val Asn Ala Met Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr
530 535 540

Leu Leu Ser Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg
545 550 555 560

Gln Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly
565 570 575

Gly Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr
580 585 590

Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser
595 600 605

Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly
610 615 620

Ala Ala Gln Lys Leu Gly Leu Thr Glu Asp Gln Phe Ile Lys Thr Pro
625 630 635 640

Thr Gly Asp Glu Phe Val Lys Ala Ser Val Arg Lys Gly Leu Leu Pro
645 650 655

Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu
660 665 670

Leu Ala Lys Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg
675 680 685

Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly

138/236

690	695	700	
Ala Gln Val Gly Arg Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr			
705	710	715	720
Gly Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Thr			
	725	730	735
Lys Tyr Thr Val Glu Asn Gly Tyr Ser Thr Ser Ala Lys Val Val Tyr			
	740	745	750
Gly Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala			
	755	760	765
Glu Ala Met Ala Leu Gly Arg Glu Ala Ala Asp Trp Val Ser Gly His			
	770	775	780
Phe Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr			
	785	790	795
Leu Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg			
	805	810	815
Pro Asp Ala His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val Arg			
	820	825	830
Arg Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ala Ser Leu Arg			
	835	840	845
Arg Leu Leu Ile Asp Arg Asp Pro Ser Gly Ala Val Ala His Ala Gln			
	850	855	860
Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu			
	865	870	875
Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys			
	885	890	895

139/236

Gln Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly

900

905

910

Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Ser Ala

915

920

925

Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val

930

935

940

Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln

945

950

955

960

Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly

965

970

975

Arg Ala Glu Ala Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr

980

985

990

Val Leu Thr Gly Lys Val Gly Gly Leu Leu Ala Phe Ala Lys Arg Arg

995

1000

1005

Asn Cys Cys Ile Gly Cys Arg Thr Val Leu Ser His Gln Gly Ala Val

1010

1015

1020

Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu Val

1025

1030

1035

1040

Ser His Leu Ser Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln

1045

1050

1055

Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser

1060

1065

1070

Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp Leu

1075

1080

1085

140/236

Glu Asp Gln Glu Arg Leu Leu Arg Arg Phe Gly Pro Pro Gly Pro Glu
 1090 1095 1100

Ala Trp
 1105

<210> 63

<211> 3457

<212> DNA

<213> *Drosophila melanogaster*

<400> 63

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141/236

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142/236

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<213> *Drosophila melanogaster*

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Gly Asp Gly Pro Glu Asn Gln Thr Thr Ser Glu Arg Trp Ser Arg Pro
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Pro Pro Pro Glu Leu Asp Pro Ser Lys His Asn Leu Glu Phe Gln Gln
65 70 75 80

Leu Asp Val Glu Asn Tyr Leu Gly Gln Pro Leu Pro Gly Met Pro Gly
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Ala Gln Ile Gly Pro Val Pro Val Val Arg Met Phe Gly Val Thr Met
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Glu Gly Asn Ser Val Cys Cys His Val His Gly Phe Cys Pro Tyr Phe
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Tyr Ile Glu Ala Pro Ser Gln Phe Glu Glu His His Cys Glu Lys Leu
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Gln Lys Ala Leu Asp Gln Lys Val Ile Ala Asp Ile Arg Asn Asn Lys
145 150 155 160

Asp Asn Val Gln Glu Ala Val Leu Met Val Glu Leu Val Glu Lys Leu
165 170 175

143/236

Asn Ile His Gly Tyr Asn Gly Asp Lys Lys Gln Arg Tyr Ile Lys Ile

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185

190

Ser Val Thr Leu Pro Arg Phe Val Ala Ala Ala Ser Arg Leu Leu Lys

195

200

205

Lys Glu Val Ile Met Ser Glu Ile Asp Phe Gln Asp Cys Arg Ala Phe

210

215

220

Glu Asn Asn Ile Asp Phe Asp Ile Arg Phe Met Val Asp Thr Asp Val

225

230

235

240

Val Gly Cys Asn Trp Ile Glu Leu Pro Met Gly His Trp Arg Ile Arg

245

250

255

Asn Ser His Ser Lys Pro Leu Pro Glu Ser Arg Cys Gln Ile Glu Val

260

265

270

Asp Val Ala Phe Asp Arg Phe Ile Ser His Glu Pro Glu Gly Glu Trp

275

280

285

Ser Lys Val Ala Pro Phe Arg Ile Leu Ser Phe Asp Ile Glu Cys Ala

290

295

300

Gly Arg Lys Gly Ile Phe Pro Glu Ala Lys Ile Asp Pro Val Ile Gln

305

310

315

320

Ile Ala Asn Met Val Ile Arg Gln Gly Glu Arg Glu Pro Phe Ile Arg

325

330

335

Asn Val Phe Thr Leu Asn Glu Cys Ala Pro Ile Ile Gly Ser Gln Val

340

345

350

Leu Cys His Asp Lys Glu Thr Gln Met Leu Asp Lys Trp Ser Ala Phe

355

360

365

144/236

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385 390 395 400

Asn Phe Glu Tyr Leu Gly Arg Ile Lys Asn Ile Arg Ser Val Ile Lys
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Leu Lys Asp Ala Tyr Leu Pro Leu Arg Leu Leu Glu Lys Leu Met Ala
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545 550 555 560

Gly Ser Asp Glu Gln Tyr Glu Gly Ala Thr Val Ile Glu Pro Lys Arg

145/236

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Gln Val Glu Arg Thr Pro Ala Asn Asn Tyr Phe Val Lys Ser Glu Val		
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Arg Arg Gly Leu Leu Pro Glu Ile Leu Glu Ser Leu Leu Ala Ala Arg		
645	650	655
Lys Arg Ala Lys Asn Asp Leu Lys Val Glu Thr Asp Pro Phe Lys Arg		
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Lys Val Leu Asp Gly Arg Gln Leu Ala Leu Lys Ile Ser Ala Asn Ser		
675	680	685
Val Tyr Gly Phe Thr Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu		
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705	710	715
Lys Asn Glu Val Glu Ser His Tyr Thr Gln Ala Asn Gly Tyr Glu Asn		
725	730	735
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Gly Val Lys Thr Leu Glu Arg Ser Met Glu Leu Gly Arg Glu Ala Ala		
755	760	765

146/236

Glu Leu Val Ser Ser Lys Phe Val His Pro Ile Lys Leu Glu Phe Glu

770

775

780

Lys Val Tyr Tyr Pro Tyr Leu Leu Ile Asn Lys Lys Arg Tyr Ala Gly

785

790

795

800

Leu Tyr Phe Thr Arg Pro Asp Thr Tyr Asp Lys Met Asp Cys Lys Gly

805

810

815

Ile Glu Thr Val Arg Arg Asp Asn Ser Pro Leu Val Ala Asn Leu Met

820

825

830

Asn Ser Cys Leu Gln Lys Leu Leu Ile Glu Arg Asp Pro Asp Gly Ala

835

840

845

Val Ala Tyr Val Lys Gln Val Ile Ala Asp Leu Leu Cys Asn Arg Ile

850

855

860

Asp Ile Ser His Leu Val Ile Thr Lys Glu Leu Ala Lys Thr Asp Tyr

865

870

875

880

Ala Ala Lys Gln Ala His Val Glu Leu Ala Ala Lys Met Lys Lys Arg

885

890

895

Asp Pro Gly Thr Ala Pro Lys Leu Gly Asp Arg Val Pro Tyr Val Ile

900

905

910

Cys Ala Ala Ala Lys Asn Thr Pro Ala Tyr Gln Lys Ala Glu Asp Pro

915

920

925

Leu Tyr Val Leu Glu Asn Ser Val Pro Ile Asp Ala Thr Tyr Tyr Leu

930

935

940

Glu Gln Gln Leu Ser Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu

945

950

955

960

147/236

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Arg Thr Val Val Thr Ser Lys Val Gly Gly Leu Ala Gly Phe Met Thr
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Lys Lys Thr Ser Cys Leu Gly Cys Lys Ser Leu Met Pro Lys Gly Tyr
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Glu Gln Ala Cys Leu Cys Pro His Cys Glu Pro Arg Met Ser Glu Leu
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Tyr Gln Lys Glu Val Gly Ala Lys Arg Glu Leu Glu Glu Thr Phe Ser
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Arg Leu Trp Thr Glu Cys Gln Arg Cys Gln Glu Ser Leu His Glu Glu
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Val Ile Cys Ser Asn Arg Asp Cys Pro Ile Phe Tyr Met Arg Gln Lys
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Val Arg Met Asp Leu Asp Asn Gln Glu Lys Arg Val Leu Arg Phe Gly
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<212> DNA

<213> *Drosophila melanogaster*

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148/236

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149/236

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150/236

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151/236

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152/236

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gctt 9064

<210> 66

<211> 2220

<212> PRT

<213> *Drosophila melanogaster*

<400> 66

Met Ser Asp Ser Gly Lys Gly Lys Val Leu Gln Asn Thr Gly Lys Phe
1 5 10 15

Val Ser Glu Asn Arg Thr Glu Gly Asp Asp Phe Phe Asn Glu Ala Gly
20 25 30

Tyr Arg Gln Ser Arg Glu Asn Asp Lys Ile Asp Ser Lys Tyr Gly Phe
35 40 45

Asp Arg Val Lys Asp Ser Gln Glu Arg Thr Gly Tyr Leu Ile Asn Met
50 55 60

His Ser Asn Glu Val Leu Asp Glu Asp Arg Arg Leu Ile Ala Ala Leu
65 70 75 80

Asp Leu Phe Phe Ile Gln Met Asp Gly Ser Arg Phe Lys Cys Thr Val
85 90 95

Ala Tyr Gln Pro Tyr Leu Leu Ile Arg Pro Glu Asp Asn Met His Leu
100 105 110

Glu Val Ala Arg Phe Leu Gly Arg Lys Tyr Ser Gly Gln Ile Ser Gly
115 120 125

Leu Glu His Ile Thr Lys Glu Asp Leu Asp Leu Pro Asn His Leu Ser
130 135 140

153/236

Gly Leu Gln Gln Gln Tyr Ile Lys Leu Ser Phe Leu Asn Gln Thr Ala
145 150 155 160

Met Thr Lys Val Arg Arg Glu Leu Met Ser Ala Val Lys Arg Asn Gln
165 170 175

Glu Arg Gln Lys Ser Asn Thr Tyr Tyr Met Gln Met Leu Ala Thr Ser
180 185 190

Leu Ala Gln Ser Ser Ala Gly Ser Glu Asp Ala Thr Leu Gly Lys Arg
195 200 205

Gln Gln Asp Tyr Met Asp Cys Ile Val Asp Ile Arg Glu His Asp Val
210 215 220

Pro Tyr His Val Arg Val Ser Ile Asp Leu Arg Ile Phe Cys Gly Gln
225 230 235 240

Trp Tyr Asn Ile Arg Cys Arg Ser Gly Val Glu Leu Pro Thr Ile Thr
245 250 255

Cys Arg Pro Asp Ile Leu Asp Arg Pro Glu Pro Val Val Leu Ala Phe
260 265 270

Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala Gln Thr
275 280 285

Asp Gln Val Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly Tyr Leu
290 295 300

Ile Thr Asn Arg Glu Ile Ile Ser Ser Asn Val Asp Asp Phe Glu Tyr
305 310 315 320

Thr Pro Lys Pro Glu Phe Glu Gly Asn Phe Ile Val Phe Asn Glu Glu
325 330 335

154/236

Asn Glu Met Gln Leu Leu Gln Arg Phe Phe Asp His Ile Met Glu Val
340 345 350

Arg Pro His Ile Ile Val Thr Tyr Asn Gly Asp Phe Phe Asp Trp Pro
355 360 365

Phe Val Glu Thr Arg Ala Ala Val Tyr Asp Leu Asp Met Lys Gln Glu
370 375 380

Ile Gly Phe Ser Lys Leu Arg Asp Gly Asn Tyr Leu Ser Arg Pro Ala
385 390 395 400

Ile His Met Asp Cys Leu Cys Trp Val Lys Arg Asp Ser Tyr Leu Pro
405 410 415

Val Gly Ser Gln Gly Leu Lys Ala Val Ala Lys Ala Lys Leu Arg Tyr
420 425 430

Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala Val Glu
435 440 445

Gln Pro Gln Val Leu Ala Asn Tyr Ser Val Ser Asp Ala Val Ala Thr
450 455 460

Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ala Leu Asn
465 470 475 480

Thr Ile Ile Pro Met Glu Pro Asp Glu Ile Leu Arg Lys Gly Ser Gly
485 490 495

Thr Leu Cys Glu Thr Leu Leu Met Val Glu Ala Tyr His Ala Gln Ile
500 505 510

Val Tyr Pro Asn Lys His Gln Ser Glu Leu Asn Lys Leu Ser Asn Glu
515 520 525

Gly His Val Leu Asp Ser Glu Thr Tyr Val Gly Gly His Val Glu Ala

155/236

530	535	540	
Leu Glu Ser Gly Val Phe Arg Ala Asp Ile Pro Cys Arg Phe Arg Leu			
545	550	555	560
Asp Pro Ala Met Val Lys Gln Leu Gln Glu Gln Val Asp Ala Val Leu			
565	570	575	
Arg His Ala Ile Glu Val Glu Glu Gly Ile Pro Leu Glu Lys Val Leu			
580	585	590	
Asn Leu Asp Glu Val Arg Gln Glu Ile Val Gln Gly Leu Gln Gly Leu			
595	600	605	
His Asp Ile Pro Asn Arg Leu Glu Gln Pro Val Ile Tyr His Leu Asp			
610	615	620	
Val Gly Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu Gln Pro			
625	630	635	640
Ser Ala Met Val Ser Asp Leu Asp Cys Ala Ala Cys Asp Phe Asn Lys			
645	650	655	
Pro Gly Val Arg Cys Lys Arg Ser Met Asp Trp Leu Trp Arg Gly Glu			
660	665	670	
Met Leu Pro Ala Ser Arg Asn Glu Phe Gln Arg Ile Gln Gln Gln Leu			
675	680	685	
Glu Thr Glu Lys Phe Pro Pro Leu Phe Pro Gly Gly Pro Gln Arg Ala			
690	695	700	
Phe His Glu Leu Ser Lys Glu Asp Gln Ala Ala Tyr Glu Lys Lys Arg			
705	710	715	720
Leu Thr Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Thr Lys Leu Thr Lys			

156/236

725	730	735
Leu Glu Thr Arg Thr Ser Thr Ile Cys Gln Lys Glu Asn Ser Phe Tyr		
740	745	750
Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Tyr Lys Gly		
755	760	765
Leu Thr Lys Val Ala Lys Ala Ser Val Asn Ala Ala Val Ala Ser Gly		
770	775	780
Asp Ala Ala Glu Ile Lys Ala Ala Lys Gly Arg Glu Val Leu Tyr Asp		
785	790	795
800		
Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr Gly Tyr		
805	810	815
Val Met Arg Arg Gly Ala Arg Trp His Ser Met Pro Met Ala Gly Ile		
820	825	830
Val Cys Leu Thr Gly Ser Asn Ile Ile Thr Lys Ala Arg Glu Ile Ile		
835	840	845
Glu Arg Val Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp Cys		
850	855	860
Ile Leu Pro Gly Ser Phe Pro Gln Glu Phe Thr Ile His Thr Ser His		
865	870	875
880		
Glu Lys Lys Lys Lys Ile Asn Ile Ser Tyr Pro Asn Ala Val Leu Asn		
885	890	895
Thr Met Val Lys Asp His Phe Thr Asn Asp Gln Tyr His Glu Leu Arg		
900	905	910
Lys Asp Lys Glu Asn Asn Leu Pro Lys Tyr Asp Ile Arg Asp Glu Asn		
915	920	925

157/236

Ser Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met Val Leu Pro

930

935

940

Ala Ala Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe

945

950

955

960

Asn Phe Asp Gly Thr Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg

965

970

975

Arg Gly Glu Leu Gln Leu Ile Lys Asn Phe Gln Ser Ser Val Phe Glu

980

985

990

Ala Phe Leu Ala Gly Ser Thr Leu Glu Glu Cys Tyr Ala Ser Val Ala

995

1000

1005

Lys Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Arg Gly Ser Asn

1010

1015

1020

Leu Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Lys Ser Met

1025

1030

1035

1040

Ser Lys Lys Leu Glu Glu Tyr Gly Ala Gln Lys Ser Thr Ser Ile Ser

1045

1050

1055

Thr Ala Lys Arg Leu Ala Glu Phe Leu Gly Glu Gln Met Val Lys Asp

1060

1065

1070

Ala Gly Leu Ala Cys Lys Tyr Ile Ile Ser Lys Lys Pro Glu Gly Ala

1075

1080

1085

Pro Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ser Glu Pro

1090

1095

1100

Ser Val Arg Arg His His Leu Arg Arg Trp Leu Lys Asp Asn Thr Met

1105

1110

1115

1120

158/236

Gly Asp Ala Asp Ile Arg Asp Val Leu Asp Trp Asn Tyr Tyr Ile Glu
1125 1130 1135

Arg Leu Gly Gly Thr Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu
1140 1145 1150

Gln Gly Leu Ala Asn Pro Val Pro Arg Val Gln His Pro Asp Trp Leu
1155 1160 1165

His Lys Lys Met Leu Glu Lys Asn Asp Val Leu Lys Gln Arg Arg Ile
1170 1175 1180

Asn Glu Met Phe Thr Ser Arg Pro Lys Pro Lys Pro Leu Ala Thr Glu
1185 1190 1195 1200

Glu Asp Lys Leu Ala Asp Met Glu Asp Leu Ala Gly Lys Asp Gly Gly
1205 1210 1215

Glu Gly Ala Ala Gly Cys Pro Ile Val Thr Lys Arg Lys Arg Ile Gln
1220 1225 1230

Leu Glu Glu His Asp Glu Glu Glu Ala Gln Pro Gln Ala Thr Thr Trp
1235 1240 1245

Arg Gln Ala Leu Gly Ala Pro Pro Pro Ile Gly Glu Thr Arg Lys Thr
1250 1255 1260

Ile Val Glu Trp Val Arg Phe Gln Lys Lys Lys Trp Lys Trp Gln Gln
1265 1270 1275 1280

Asp Gln Arg Gln Arg Asn Arg Gln Ala Ser Lys Arg Thr Arg Gly Glu
1285 1290 1295

Asp Pro Arg Tyr Thr Gly Arg Phe Leu Arg Arg Ala Gln Arg Thr Leu
1300 1305 1310

Leu Asp Gln Pro Trp Gln Ile Val Gln Leu Val Pro Val Asp Asp Leu

159/236

1315	1320	1325	
Gly His Phe Thr Val Trp Ala Leu Ile Gly Glu Glu Leu His Lys Ile			
1330	1335	1340	
Lys Leu Thr Val Pro Arg Ile Phe Tyr Val Asn Gln Arg Ser Ala Ala			
1345	1350	1355	1360
Pro Pro Glu Glu Gly Gln Leu Trp Arg Lys Val Asn Arg Val Leu Pro			
1365	1370	1375	
Arg Ser Arg Pro Val Phe Asn Leu Tyr Arg Tyr Ser Val Pro Glu Gln			
1380	1385	1390	
Leu Phe Arg Asp Asn Ser Leu Gly Met Leu Ala Asp Leu Ala Thr Pro			
1395	1400	1405	
Asp Ile Glu Gly Ile Tyr Glu Thr Gln Met Thr Leu Glu Phe Arg Ala			
1410	1415	1420	
Leu Met Asp Met Gly Cys Ile Cys Gly Val Gln Arg Glu Glu Ala Arg			
1425	1430	1435	1440
Arg Leu Ala Gln Leu Ala Thr Lys Asp Leu Glu Thr Phe Ser Ile Glu			
1445	1450	1455	
Gln Leu Glu Gln Gly Pro Arg Leu Arg Ser Asn Ile Trp Leu Ala Pro			
1460	1465	1470	
Thr Ile Asp Cys Ala Lys Ser Thr Cys Ile Ser Ile Thr His Arg Arg			
1475	1480	1485	
Pro Arg Arg Arg Ser Val Ser Leu Ile Pro Met Pro Ser Lys Lys Ala			
1490	1495	1500	
Phe Val Phe Ala Leu Asp Thr Val Arg Ala Asn Gln Met Pro Asn Met			
1505	1510	1515	1520

160/236

Arg Gln Leu Tyr Thr Ala Glu Arg Leu Ala Leu Leu Lys Asn Leu Thr

1525

1530

1535

Ala Glu Glu Gln Asp Lys Ile Pro Val Glu Asp Tyr Thr Phe Glu Val

1540

1545

1550

Leu Ile Glu Val Asp Val Lys Gln Ile Tyr Arg His Ile Gln Arg Ala

1555

1560

1565

Leu Thr Thr Tyr Lys Gln Glu His Gln Gly Pro Pro Thr Ile Leu Cys

1570

1575

1580

Leu Gln Thr Ala Leu Ser Ala Arg Lys Leu Ser Leu Ala Met Pro Ile

1585

1590

1595

1600

Leu Leu Glu Phe Pro Gln Ala Gln Ile His Ile Ser Asp Asp Ala Ser

1605

1610

1615

Leu Leu Ser Gly Leu Asp Trp Gln Arg Gln Gly Ser Arg Ala Val Ile

1620

1625

1630

Arg His Phe Leu Asn Leu Asn Asn Val Leu Asp Leu Met Leu Asp Gln

1635

1640

1645

Cys Arg Tyr Phe His Val Pro Ile Gly Asn Met Pro Pro Asp Thr Val

1650

1655

1660

Leu Phe Gly Ala Asp Leu Phe Phe Ala Arg Leu Leu Gln Arg His Asn

1665

1670

1675

1680

Phe Val Leu Trp Trp Ser Ala Ser Thr Arg Pro Asp Leu Gly Gly Arg

1685

1690

1695

Glu Ala Asp Asp Ser Arg Leu Leu Ala Glu Phe Glu Glu Ser Ile Ser

1700

1705

1710

161/236

Val Val Gln Asn Lys Ala Gly Phe Tyr Pro Asp Val Cys Val Glu Leu
1715 1720 1725

Ala Leu Asp Ser Leu Ala Val Ser Ala Leu Leu Gln Ser Thr Arg Ile
1730 1735 1740

Gln Glu Met Glu Gly Ala Ser Ser Ala Ile Thr Phe Asp Val Met Pro
1745 1750 1755 1760

Gln Val Ser Leu Glu Glu Met Ile Gly Thr Val Pro Ala Ala Thr Leu
1765 1770 1775

Pro Ser Tyr Asp Glu Thr Ala Leu Cys Ser Ala Ala Phe Arg Val Met
1780 1785 1790

Arg Ser Met Val Asn Gly Trp Leu Arg Glu Val Ser Ile Asn Arg Asn
1795 1800 1805

Ile Phe Ser Asp Phe Gln Ile Val His Phe Tyr Arg Trp Val Arg Ser
1810 1815 1820

Ser Asn Ala Leu Leu Tyr Asp Pro Ala Leu Arg Arg Ser Leu Asn Asn
1825 1830 1835 1840

Leu Met Arg Lys Met Phe Leu Arg Ile Ile Ala Glu Phe Lys Arg Leu
1845 1850 1855

Gly Ala Thr Ile Ile Tyr Ala Asp Phe Asn Arg Ile Ile Leu Ser Ser
1860 1865 1870

Gly Lys Lys Thr Val Ser Asp Ala Leu Gly Tyr Val Asp Tyr Ile Val
1875 1880 1885

Gln Ser Leu Arg Asn Lys Glu Met Phe His Ser Ile Gln Leu Ser Phe
1890 1895 1900

162/236

Glu Gln Cys Trp Asn Phe Met Leu Trp Met Asp Gln Ala Asn Phe Ser
1905 1910 1915 1920

Gly Ile Arg Gly Lys Leu Pro Lys Gly Ile Asp Glu Thr Val Ser Ser
1925 1930 1935

Ile Val Ser Thr Thr Met Ile Arg Asp Ser Glu Arg Asn Gln Asp Asp
1940 1945 1950

Asp Glu Asp Glu Glu Glu Asp Ser Glu Asn Arg Asp Pro Val Glu Ser
1955 1960 1965

Asn Glu Ala Glu Gln Asp Gln Glu Asp Glu Leu Ser Leu Glu Leu Asn
1970 1975 1980

Trp Thr Ile Gly Glu His Leu Pro Asp Glu Asn Glu Cys Arg Glu Lys
1985 1990 1995 2000

Phe Glu Ser Leu Leu Thr Leu Phe Met Gln Ser Leu Ala Glu Lys Lys
2005 2010 2015

Thr Thr Glu Gln Ala Ile Lys Asp Ile Ser His Cys Ala Phe Asp Phe
2020 2025 2030

Ile Leu Lys Leu His Lys Asn Tyr Gly Lys Gly Lys Pro Ser Pro Gly
2035 2040 2045

Leu Glu Leu Ile Arg Thr Leu Ile Lys Ala Leu Ser Val Asp Lys Thr
2050 2055 2060

Leu Ala Glu Gln Ile Asn Glu Leu Arg Arg Asn Met Leu Arg Leu Val
2065 2070 2075 2080

Gly Ile Gly Glu Phe Ser Asp Leu Ala Glu Trp Glu Asp Pro Cys Asp
2085 2090 2095

Ser His Ile Ile Asn Glu Val Ile Cys Lys Ala Cys Asn His Cys Arg

163/236

2100	2105	2110
Asp Leu Asp Leu Cys Lys Asp Lys His Arg Ala Met Lys Asp Gly Cys		
2115	2120	2125
Tyr Val Ala Tyr Asp Asn Glu Glu Ile Glu Met Arg Met Leu Asp Ala		
2130	2135	2140
Leu Gln Arg Lys Met Met Ser Tyr Val Leu Gln Asp Leu Arg Cys Ser		
2145	2150	2155
Arg Cys Ser Glu Ile Lys Arg Glu Asn Leu Ala Glu Phe Cys Thr Cys		
2165	2170	2175
Ala Gly Asn Phe Val Pro Leu Ile Ser Gly Lys Asp Ile Gln Thr Leu		
2180	2185	2190
Leu Gly Thr Phe Asn Lys Val Ala Ala Asn His Lys Met Gln Leu Leu		
2195	2200	2205
Gln Gln Thr Val His Gln Ala Leu Thr Thr Pro Arg		
2210	2215	2220

<210> 67

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 67

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26

<210> 68

164/236

<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 68
ggaattcctt gtcccggtc aggtca 26

<210> 69
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 69
cagaactttg cctcccata cctc 24

<210> 70
<211> 3318
<212> DNA
<213> Mus musculus

<400> 70
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gaggaaatag aggctgagaa ccggctgcag gaggcagagg aggagctgca gctgccccca 180
gagggcaccg tgggtgggca gttttccact gcagacattg accctoggtg gcggcggccc 240

165/236

accctacgtg ccctggaccc cagcacggag cccctcatct tccagcagct ggagattgac 300
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 ccatactga gggccttttg ggtcacccgat gaaggcttct ccgtctgtg ccacatacag 420
 ggctttgccc cctacttcta cccccccg cctcctggtt ttggggccga gcacctgagt 480
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 ggtcatggcc cttctccatt tctccgcatc accctggcac taccgccct tatggcacca 660
 gcccgccgcc ttctggaaca ggggtgtccga gtgccaggcc tgggcacccc gagcttcgca 720
 ccctacgaag ccaacgtgga ctttgagatc cggttcatgg tggatgtga cattgtggga 780
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 cggcgggaca gtaagtgat cagcatggtg ggtcgcgttc agatggatat gctgcaggtg 1380

166/236

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cagacgcgcc gccgcctggc cgtgtactgc ctgaaggacg cctttctgcc actccgacta 1560
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167/236

aaaatggact gcaagggcct ggaggctgtg cgcagggaca actgtcccct ggtggccaac 2520
 ctcggtacat cctctctgcg ccggatcctc gtggaccggg accctgatgg ggcagtagcc 2580
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 aagaaggtgc gcaaggacct ggaagaccag gaacggctgc tgcagcgctt tggaccgccc 3300
 ggccctgagg cctggtga 3318

<210> 71

<211> 29

<212> DNA

<213> Artificial Sequence

168/236

<220>

<223> primer

<400> 71

tccccgcggc tgcagaggat ttccacag

29

<210> 72

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 72

ggactagtat ggtatgcaca acagcctc

28

<210> 73

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 73

tccccgcgga gtggttgtgg gagacttac

29

<210> 74

<211> 28

<212> DNA

<213> Artificial Sequence

169/236

<220>

<223> primer

<400> 74

ggactagtca gtccacagt cccaaagt

28

<210> 75

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 75

ctgagagtga tgaggttc

18

<210> 76

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 76

ctaatacgcca tcttcagca g

21

<210> 77

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

170/236

<223> primer

<400> 77

gctcgacgtt gtcactgaag

20

<210> 78

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 78

ccaacgctat gtcctgatag

20

<210> 79

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 79

gctcgacgtt gtcactgaag

20

<210> 80

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

171/236

<400> 80

ccaacgctat gtcctgatag

20

<210> 81

<211> 5725

<212> DNA

<213> Mus musculus

<400> 81

agtgggttg ggagacttac cgtcctcttg tctctggaga gtgccttcta ccatgtcacc 60

agaagggtg tcactcttgt ccccgatttc ttccacatca ttgtcctgag catcagcagc 120

gtotccaatg gggcagtta atttgaggca atacttactc ttcaactggc cgttactttc 180

acctggacta gacacatcgc gcttctgaga acacacttta tccaaaaacc ggataccgaa 240

atcctgcccg gactacatca tcaagttgat gtcctccttt ttacgaaaa tctttgttgt 300

gtacctgtag ttcagcacct ctccaatat gtgggagcag atgaaatcta tctctatgat 360

ggacaagctg tccagttcta gcttcttgaa aagtttcttt ttttttctt tcaatttttt 420

attaggtatt tagctcattt acatttccaa tgctatacca aaagtcccc ataccaccc 480

acccccactc cctaccgcg tcaactcacc tttttggccc tggcgttccc ctgttctggg 540

gcatataaag ttgtgtgtc caatgggcct ctctttccag tgatggccga ctaggccatc 600

tttgataca tatgcagcta gactcaagag ctccggggta ctggttagtt cataatgttg 660

atccacctat agggttgcag atcccttag ctcttgggt actttctcta gtcctccat 720

tgggagccct gtatccatc cattagctga ctgtgggcac ccacttctgt gtttgctagg 780

172/236

ccccggcata gtctcacaag agacagctac atctgggtcc ttctgataaa atcttgctag 840

tgtatgcaat ggtgtcagcg ttgggatgct gattatgggg tggatccctg gataaggcag 900

tctctacatg gtccatcctt tcattctcagc tccaaacttt gtctctgtaa ctcttccaa 960

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catgagtttc atgtgtttag gaaattgtat cttatatctt gggatcccta ggttttgggc 1080

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tttcattagg tccatttgt caattctoga tttacagca caagccattg ctgttctgtt 1920

173/236

caggaatittt tccctgtgc ccatacttc aaggctttc ccacittct cctctataag 1980

tttcagtgc tctggtttta tgtgaagttc tttgatccat ttagatttga ccttagtaca 2040

aggagataag tatggatcga ttgcattct tctacatgat aacaaccagt tgtccagca 2100

ccatttgttg aaaatgctgt ctttcttcca ctggatggtt ttagctccct tgcgaagat 2160

caagtgaacca taggtgtgtg ggttcatttc tgggtcttca attctattcc attggtctac 2220

ttgtctgtct ctataccagt accatgcagt ttttaaccaca attgctctgt agtaaagctt 2280

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gacttctct tttccaattt gtatcccott gatctccttt tgttgtogaa ttgctcagca 2880

ctgcagtatt cttacaag ttgattctca ttagaaaata aagctgcat atgaccatct 2940

aacacttagt aactgggaaa atttgatttg atctggtgat ttgtcacagc aataacaaag 3000

174/236

taactatcac aatggctgaa acaagctctgc tcacttggaa tcaacacttt ttgtcccagg 3060

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actccaggcc agccaatcca acaagcccaa taccttgaag gatgaaaccc atgccaaga 3240

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acgtttctaa acagtttgct aatttatctt ggcagctgag gcagctatgg gagccacagc 3540

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ccaggttctt aaaatactgt ttctctgtac atacctaagt aatctttaca ttggaaaaca 4020

aacaaatagt aaagctctgt tgttgtgtt gataagtagc aaattaattt agggggagca 4080

175/236

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176/236

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 ggcaccaaac cgcaattcca ctaaagcccc accctccca ttaccatcct gccgaaacca 5400
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 gatgccccgc ctcttctat aaatcctggc gctcaaatac tgtggtcggg ggcaggaac 5640
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 gaggtacttt gggactgtgg gactg 5725

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 <211> 30
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 <213> Artificial Sequence

<220>
 <223> primer

<400> 82
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30

<210> 83
 <211> 30
 <212> DNA
 <213> Artificial Sequence

177/236

<220>

<223> primer

<400> 83

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30

<210> 84

<211> 30

<212> DNA

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<220>

<223> primer

<400> 84

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30

<210> 85

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 85

gagtgaggat ttgtacatga tctgaagg

28

<210> 86

<211> 3357

<212> DNA

<213> Mus musculus

178/236

<220>

<221> CDS

<222> (24).. (3341)

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Met Asp Cys Lys Arg Arg Gln Gly Pro Gly

1 5 10

cct ggg gtg ccc cca aag cgg gct cga ggg cac ctc tgg gat gag gac 101

Pro Gly Val Pro Pro Lys Arg Ala Arg Gly His Leu Trp Asp Glu Asp

15 20 25

gag cct tcg ccg tcg cag ttt gag gcg aac ctg gca ctg ctg gag gaa 149

Glu Pro Ser Pro Ser Gln Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu

30 35 40

ata gag gct gag aac cgg ctg cag gag gca gag gag gag ctg cag ctg 197

Ile Glu Ala Glu Asn Arg Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu

45 50 55

ccc cca gag ggc acc gtg ggt ggg cag ttt tcc act gca gac att gac 245

Pro Pro Glu Gly Thr Val Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp

60 65 70

cct cgg tgg cgg cgg ccc acc cta cgt gcc ctg gac ccc agc acg gag 293

Pro Arg Trp Arg Arg Pro Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu

75 80 85 90

ccc ctc atc ttc cag cag ctg gag att gac cac tat gtg ggc tca gca 341

Pro Leu Ile Phe Gln Gln Leu Glu Ile Asp His Tyr Val Gly Ser Ala

95 100 105

cca ccc ctg cca gaa ggg ccc ctg cca tcc cgg aac tca gtg ccc ata 389

Pro Pro Leu Pro Glu Gly Pro Leu Pro Ser Arg Asn Ser Val Pro Ile

110 115 120

179/236

ctg agg gcc ttt ggg gtc acc gat gaa ggc ttc tcc gtc tgc tgc cac 437
 Leu Arg Ala Phe Gly Val Thr Asp Glu Gly Phe Ser Val Cys Cys His
 125 130 135

ata cag ggc ttt gcc ccc tac ttc tac acc ccc gcg cct cct ggt ttt 485
 Ile Gln Gly Phe Ala Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe
 140 145 150

ggg gcc gag cac ctg agt gag ctg cag cag gag ctg aac gca gcc atc 533
 Gly Ala Glu His Leu Ser Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile
 155 160 165 170

agc cgg gac cag cgc ggt ggg aag gag ctc tca ggg cgg gca gtg ctg 581
 Ser Arg Asp Gln Arg Gly Gly Lys Glu Leu Ser Gly Pro Ala Val Leu
 175 180 185

gca ata gag cta tgc tcc ogt gag agc atg ttt ggg tac cac ggt cat 629
 Ala Ile Glu Leu Cys Ser Arg Glu Ser Met Phe Gly Tyr His Gly His
 190 195 200

ggc cct tct cca ttt ctc cgc atc acc ctg gca cta ccc cgc ctt atg 677
 Gly Pro Ser Pro Phe Leu Arg Ile Thr Leu Ala Leu Pro Arg Leu Met
 205 210 215

gca cca gcc cgc cgc ctt ctg gaa cag ggt gtc cga gtg cca ggc ctg 725
 Ala Pro Ala Arg Arg Leu Leu Glu Gln Gly Val Arg Val Pro Gly Leu
 220 225 230

ggc acc cgg agc ttc gca ccc tac gaa gcc aac gtg gac ttt gag atc 773
 Gly Thr Pro Ser Phe Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile
 235 240 245 250

ogg ttc atg gtg gat gct gac att gtg gga tgc aac tgg ttg gag ctg 821
 Arg Phe Met Val Asp Ala Asp Ile Val Gly Cys Asn Trp Leu Glu Leu
 255 260 265

180/236

cca gct gga aag tac gtt cgg agg gcg gag aag aag gcc acc ctg tgt	869
Pro Ala Gly Lys Tyr Val Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys	
270 275 280	
cag ctg gag gtg gac gtg ctg tgg tca gat gtg atc agt cac cca ccg	917
Gln Leu Glu Val Asp Val Leu Trp Ser Asp Val Ile Ser His Pro Pro	
285 290 295	
gag ggg cag tgg cag cgc att gca ccc ctg cgt gtg ctt agc ttc gac	965
Glu Gly Gln Trp Gln Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp	
300 305 310	
atc gag tgt gct ggc cga aaa ggc atc ttc cct gag cct gag cgt gac	1013
Ile Glu Cys Ala Gly Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp	
315 320 325 330	
ccc gtg atc cag atc tgt tct ctg ggg ctg cgc tgg ggg gag ccg gag	1061
Pro Val Ile Gln Ile Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu	
335 340 345	
cca ttc ttg cgt ctg gca ctc acg ctg cgg ccc tgt gcc ccc atc ctg	1109
Pro Phe Leu Arg Leu Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu	
350 355 360	
ggt gcc aaa gtg cag agc tat gag cgg gaa gaa gac ctg ctc cag gcc	1157
Gly Ala Lys Val Gln Ser Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala	
365 370 375	
tgg gcc gac ttc atc ctt gcc atg gac cct gac gtg atc acc ggc tac	1205
Trp Ala Asp Phe Ile Leu Ala Met Asp Pro Asp Val Ile Thr Gly Tyr	
380 385 390	
aac att cag aac ttt gac ctc cca tac ctc atc tct cgg gca cag gcc	1253
Asn Ile Gln Asn Phe Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala	
395 400 405 410	
cta aag gtg gac cgc ttc cct ttc ctg ggc cgc gtg act ggt ctc cgc	1301

181/236

Leu Lys Val Asp Arg Phe Pro Phe Leu Gly Arg Val Thr Gly Leu Arg	
415 420 425	
tcc aac atc cgt gac tcc tcc ttc caa tca agg cag gtc ggc cgg cgg	1349
Ser Asn Ile Arg Asp Ser Ser Phe Gln Ser Arg Gln Val Gly Arg Arg	
430 435 440	
gac agt aag gtg atc agc atg gtg ggt cgc gtt cag atg gat atg ctg	1397
Asp Ser Lys Val Ile Ser Met Val Gly Arg Val Gln Met Asp Met Leu	
445 450 455	
cag gtg ctg ctt cgg gaa cac aag ctc cgc tcc tac acg ctc aac gct	1445
Gln Val Leu Leu Arg Glu His Lys Leu Arg Ser Tyr Thr Leu Asn Ala	
460 465 470	
gtg agt ttc cac ttc ctg ggc gag cag aag gag gac gtt cag cac agc	1493
Val Ser Phe His Phe Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser	
475 480 485 490	
atc atc acc gac ctg cag aat ggg aac gaa cag acg cgc cgc cgc ctg	1541
Ile Ile Thr Asp Leu Gln Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu	
495 500 505	
gcc gtg tac tgc ctg aag gac gcc ttt ctg cca ctc cga cta cta gag	1589
Ala Val Tyr Cys Leu Lys Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu	
510 515 520	
cgc ctt atg gtg ctg gtg aat aat gtg gag atg gcg cgt gtc acg ggt	1637
Arg Leu Met Val Leu Val Asn Asn Val Glu Met Ala Arg Val Thr Gly	
525 530 535	
gta ccc ctt ggg tac ctg ctc acc cgg ggc cag cag gtc aag gtc gtg	1685
Val Pro Leu Gly Tyr Leu Leu Thr Arg Gly Gln Gln Val Lys Val Val	
540 545 550	
tct cag ctg ctg cgc cag gcc atg cgc cag ggg ctg ctg atg cct gtg	1733
Ser Gln Leu Leu Arg Gln Ala Met Arg Gln Gly Leu Leu Met Pro Val	

182/236

555	560	565	570	
gtg aag acc gag ggc agt gag gac tac acg gga gcc aca gtc att gag				1781
Val Lys Thr Glu Gly Ser Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu				
	575	580	585	
ccc ctc aaa ggg tac tat gac gtc ccc att gcc acc ctg gac ttc tcc				1829
Pro Leu Lys Gly Tyr Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser				
	590	595	600	
tcc ttg tac cca tcc atc atg atg gcc cat aat ctg tgc tac acc acg				1877
Ser Leu Tyr Pro Ser Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr				
	605	610	615	
ctg ctc cga cct ggg gct gcc cag aag ctg ggc ctt aaa cca gat gag				1925
Leu Leu Arg Pro Gly Ala Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu				
	620	625	630	
ttc atc aag aca ccc act ggg gat gag ttt gtg aag tca tct gta cgg				1973
Phe Ile Lys Thr Pro Thr Gly Asp Glu Phe Val Lys Ser Ser Val Arg				
	635	640	645	650
aag ggc ctc ctg ccc cag atc ctg gag aat ctg ctg agt gcc cgc aag				2021
Lys Gly Leu Leu Pro Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys				
	655	660	665	
agg gcc aag gct gag ctg gct cag gag acg gac ccc ctg cgg cga cag				2069
Arg Ala Lys Ala Glu Leu Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln				
	670	675	680	
gtc ttg gac ggc cgg caa ctg gca cta aaa gtg agt gcc aac tcc gta				2117
Val Leu Asp Gly Arg Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val				
	685	690	695	
tat ggc ttc act ggt gcc cag gtg ggc aag ctg cca tgt ttg gag atc				2165
Tyr Gly Phe Thr Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu Ile				
	700	705	710	

184/236

gta gcc cat gcc aag gac gtc atc tcg gac ctg ctg tgc aac cgc ata	2645
Val Ala His Ala Lys Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile	
860 865 870	
gac atc tcc cag ctg gtc atc acc aaa gag ttg acc cgc gca gca gca	2693
Asp Ile Ser Gln Leu Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala	
875 880 885 890	
gac tat gct ggc aag cag gct cac gtg gag ctg gct gag agg atg agg	2741
Asp Tyr Ala Gly Lys Gln Ala His Val Glu Leu Ala Glu Arg Met Arg	
895 900 905	
aag cgc gac ccc ggc agt gcg ccc agc ctg ggt gac cga gtc ccc tat	2789
Lys Arg Asp Pro Gly Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr	
910 915 920	
gtg atc att ggt gct gct aag ggt gtg gcc gcc tac atg aag tcg gag	2837
Val Ile Ile Gly Ala Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu	
925 930 935	
gac ccc ctg ttt gtg ctg gag cac agc ctg ccc atc gac act cag tac	2885
Asp Pro Leu Phe Val Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr	
940 945 950	
tac ctg gag cag cag ctg gcc aag ccg ctc ttg cgc atc ttt gag ccc	2933
Tyr Leu Glu Gln Gln Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro	
955 960 965 970	
atc ctg ggt gag ggc cgt gca gag tct gtg ctg ctg cgc ggt gac cac	2981
Ile Leu Gly Glu Gly Arg Ala Glu Ser Val Leu Leu Arg Gly Asp His	
975 980 985	
aca cga tgc aag act gtg ctc acc agc aag gtg ggc ggc ctc ttg gcc	3029
Thr Arg Cys Lys Thr Val Leu Thr Ser Lys Val Gly Gly Leu Leu Ala	
990 995 1000	
ttc acc aag cgc cgc aac tgt tgc att ggc tgc cgc tcc gta atc	3074

185/236

Phe Thr Lys	Arg Arg Asn Cys Cys	Ile Gly Cys Arg Ser	Val Ile	
1005	1010	1015		
<i>gac cat caa</i>	<i>gga gcc gtg tgt aag</i>	<i>ttc tgt cag cca cgg</i>	<i>gag tcg</i>	3119
Asp His Gln	Gly Ala Val Cys Lys	Phe Cys Gln Pro Arg	Glu Ser	
1020	1025	1030		
<i>gag ctc tat</i>	<i>cag aag gag gtg tca</i>	<i>cac ctg aat gcc ttg</i>	<i>gaa gaa</i>	3164
Glu Leu Tyr	Gln Lys Glu Val Ser	His Leu Asn Ala Leu	Glu Glu	
1035	1040	1045		
<i>cgg ttc tct</i>	<i>cgc ctc tgg aca cag</i>	<i>tgt caa cgc tgc cag</i>	<i>ggc agc</i>	3209
Arg Phe Ser	Arg Leu Trp Thr Gln	Cys Gln Arg Cys Gln	Gly Ser	
1050	1055	1060		
<i>ttg cat gag</i>	<i>gac gtc atc tgt acc</i>	<i>agc cgt gac tgt ccc</i>	<i>atc ttc</i>	3254
Leu His Glu	Asp Val Ile Cys Thr	Ser Arg Asp Cys Pro	Ile Phe	
1065	1070	1075		
<i>tac atg cgc</i>	<i>aag aag gtg cgc aag</i>	<i>gac ctg gaa gac cag</i>	<i>gaa cgg</i>	3299
Tyr Met Arg	Lys Lys Val Arg Lys	Asp Leu Glu Asp Gln	Glu Arg	
1080	1085	1090		
<i>ctg ctg cag</i>	<i>cgc ttt gga ccg ccc</i>	<i>ggc cct gag gcc tgg</i>	<i>tga</i>	3341
Leu Leu Gln	Arg Phe Gly Pro Pro	Gly Pro Glu Ala Trp		
1095	1100	1105		
<i>cctgacacgg gacaag</i>				3357

<210> 87

<211> 1105

<212> PRT

<213> Mus musculus

<400> 87

186/236

Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys
1 5 10 15

Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln
20 25 30

Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg
35 40 45

Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val
50 55 60

Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro
65 70 75 80

Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln
85 90 95

Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly
100 105 110

Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val
115 120 125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro
130 135 140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser

187/236

145 150 155 160

Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly
 165 170 175

Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser
 180 185 190

Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu
 195 200 205

Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu
 210 215 220

Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala
225 230 235 240

Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala
 245 250 255

Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val
 260 265 270

Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val
 275 280 285

Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg
 290 295 300

188/236

Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala
340 345 350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp
385 390 395 400

Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe
405 410 415

Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser
420 425 430

Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser
435 440 445

189/236

Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu
450 455 460

His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu
465 470 475 480

Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln
485 490 495

Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys
500 505 510

Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val
515 520 525

Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu
530 535 540

Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln
545 550 555 560

Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser
565 570 575

Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr
580 585 590

190/236

Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile
595 600 605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala
610 615 620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr
625 630 635 640

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln
645 650 655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu
660 665 670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln
675 680 685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala
690 695 700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly
705 710 715 720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys
725 730 735

191/236

Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly
740 745 750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu
755 760 765

Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe
770 775 780

Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu
785 790 795 800

Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser
805 810 815

Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg
820 825 830

Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
835 840 845

Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
865 870 875 880

Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln

192/236

885

890

895

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
900 905 910

Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu
930 935 940

Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu
945 950 955 960

Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg
965 970 975

Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val
980 985 990

Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn
995 1000 1005

Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val
1010 1015 1020

Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu
1025 1030 1035

193/236

Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp
 1040 1045 1050

Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile
 1055 1060 1065

Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val
 1070 1075 1080

Arg Lys Asp Leu Glu Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly
 1085 1090 1095

Pro Pro Gly Pro Glu Ala Trp
 1100 1105

<210> 88

<211> 3318

<212> DNA

<213> Mus musculus

<220>

<221> CDS

<222> (1).. (3318)

<400> 88

atg gat tgt aag cgg oga caa gga cca ggc cct ggg gtg ccc cca aag 48

Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys

1

5

10

15

194/236

cgg gct cga ggg cac ctc tgg gat gag gac gag cct tgg ccg tcg cag	96
Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln	
20 25 30	
ttt gag gcg aac ctg gca ctg ctg gag gaa ata gag gct gag aac cgg	144
Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg	
35 40 45	
ctg cag gag gca gag gag gag ctg cag ctg ccc cca gag ggc acc gtg	192
Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val	
50 55 60	
ggt ggg cag ttt tcc act gca gac att gac cct cgg tgg cgg cgg ccc	240
Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro	
65 70 75 80	
acc cta cgt gcc ctg gac ccc agc acg gag ccc ctc atc ttc cag cag	288
Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln	
85 90 95	
ctg gag att gac cac tat gtg ggc tca gca cca ccc ctg cca gaa ggg	336
Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly	
100 105 110	
ccc ctg cca tcc cgg aac tca gtg ccc ata ctg agg gcc ttt ggg gtc	384
Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val	
115 120 125	
acc gat gaa ggc ttc tcc gtc tgc tgc cac ata cag ggc ttt gcc ccc	432
Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro	
130 135 140	
tac ttc tac acc ccc gog cct cct ggt ttt ggg gcc gag cac ctg agt	480
Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser	
145 150 155 160	

195/236

gag ctg cag cag gag ctg aac gca gcc atc agc cgg gac cag cgc ggt	528
Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly	
165 170 175	
ggg aag gag ctc tca ggg ccg gca gtg ctg gca ata gag cta tgc tcc	576
Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser	
180 185 190	
cgt gag agc atg ttt ggg tac cac ggt cat ggc cct tct cca ttt ctc	624
Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu	
195 200 205	
cgc atc acc ctg gca cta ccc cgc ctt atg gca cca gcc cgc cgc ctt	672
Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu	
210 215 220	
ctg gaa cag ggt gtc cga gtg cca ggc ctg ggc acc ccg agc ttc gca	720
Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala	
225 230 235 240	
ccc tac gaa gcc aac gtg gac ttt gag atc cgg ttc atg gtg gat gct	768
Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala	
245 250 255	
gac att gtg gga tgc aac tgg ttg gag ctg cca got gga aag tac gtt	816
Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val	
260 265 270	
cgg agg gcg gag aag aag gcc acc ctg tgt cag ctg gag gtg gac gtg	864
Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val	
275 280 285	
ctg tgg tca gat gtg atc agt cac cca ccg gag ggg cag tgg cag cgc	912
Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg	
290 295 300	
att gca ccc ctg cgt gtg ctt agc ttc gac atc gag tgt gct ggc cga	960

196/236

Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg	
305	320
aaa ggc atc ttc cct gag cct gag cgt gac ccc gtg atc cag atc tgt	1008
Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys	
325	335
tot ctg ggg ctg cgc tgg ggg gag ccg gag cca ttc ttg cgt ctg gca	1056
Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala	
340	350
ctc acg ctg cgg ccc tgt gcc ccc atc ctg ggt gcc aaa gtg cag agc	1104
Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser	
355	365
tat gag cgg gaa gaa gac ctg ctc cag gcc tgg gcc gac ttc atc ctt	1152
Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu	
370	380
gcc atg gac cct gac gtg atc acc ggc tac aac att cag aac ttt gcc	1200
Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Ala	
385	400
ctc cca tac ctc atc tct cgg gca cag gcc cta aag gtg gac cgc ttc	1248
Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe	
405	415
cct ttc ctg ggc cgc gtg act ggt ctc cgc tcc aac atc cgt gac tcc	1296
Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser	
420	430
tcc ttc caa tca agg cag gtc ggc cgg cgg gac agt aag gtg atc agc	1344
Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser	
435	445
atg gtg ggt cgc gtt cag atg gat atg ctg cag gtg ctg ctt cgg gaa	1392
Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu	

197/236

450	455	460	
cac aag ctc cgc tcc tac acg ctc aac got gtg agt ttc cac ttc ctg			1440
His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu			
465	470	475	480
ggc gag cag aag gag gac gtt cag cac agc atc atc acc gac ctg cag			1488
Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln			
485	490	495	
aat ggg aac gaa cag acg cgc cgc cgc ctg gcc gtg tac tgc ctg aag			1536
Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys			
500	505	510	
gac gcc ttt ctg cca ctc cga cta cta gag cgc ctt atg gtg ctg gtg			1584
Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val			
515	520	525	
aat aat gtg gag atg gcg cgt gtc acg ggt gta ccc ctt ggg tac ctg			1632
Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu			
530	535	540	
ctc acc cgg ggc cag cag gtc aag gtc gtg tct cag ctg ctg cgc cag			1680
Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln			
545	550	555	560
gcc atg cgc cag ggg ctg ctg atg cct gtg gtg aag acc gag ggc agt			1728
Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser			
565	570	575	
gag gac tac acg gga gcc aca gtc att gag ccc ctc aaa ggg tac tat			1776
Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr			
580	585	590	
gac gtc ccc att gcc acc ctg gac ttc tcc tcc ttg tac cca tcc atc			1824
Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile			
595	600	605	

198/236

atg atg gcc cat aat ctg tgc tac acc acg ctg ctc cga cct ggg gct	1872
Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala	
610 615 620	
gcc cag aag ctg ggc ctt aaa cca gat gag ttc atc aag aca ccc act	1920
Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr	
625 630 635 640	
ggg gat gag ttt gtg aag tca tct gta cgg aag ggc ctc ctg ccc cag	1968
Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln	
645 650 655	
atc ctg gag aat ctg ctg agt gcc cgc aag agg gcc aag gct gag ctg	2016
Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu	
660 665 670	
gct cag gag acg gac ccc ctg cgg cga cag gtc ttg gac ggc cgg caa	2064
Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln	
675 680 685	
ctg gca cta aaa gtg agt gcc aac tcc gta tat ggc ttc act ggt gcc	2112
Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala	
690 695 700	
cag gtg ggc aag ctg cca tgt ttg gag atc tcc cag agt gtc act ggg	2160
Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly	
705 710 715 720	
ttc ggg cgg cag atg att gag aaa acc aag cag ctt gtg gag tcc aag	2208
Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys	
725 730 735	
tac acc gtg gaa aat ggc tac gat gcc aac gcc aag gta gtc tac ggt	2256
Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly	
740 745 750	

199/236

gac acg gac tct gtg atg tgc cgg ttt ggc gtc tcc tct gtg gct gaa	2304
Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu	
755 760 765	
gca atg tct ctg ggg cgg gag gct gca aac tgg gta tcc agt cac ttc	2352
Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe	
770 775 780	
cca tca ccc atc cgg ctg gag ttc gag aag gtt tac ttc cca tac ctg	2400
Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu	
785 790 795 800	
ctc atc agc aag aag cgc tat gct ggc ctg ctc ttc tcc tcc cgc tct	2448
Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser	
805 810 815	
gat gcc cat gac aaa atg gac tgc aag ggc ctg gag gct gtg cgc agg	2496
Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg	
820 825 830	
gac aac tgt ccc ctg gtg gcc aac ctc gtt aca tcc tct ctg cgc cgg	2544
Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg	
835 840 845	
atc ctc gtg gac cgg gac cct gat ggg gca gta gcc cat gcc aag gac	2592
Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp	
850 855 860	
gtc atc tcg gac ctg ctg tgc aac cgc ata gac atc tcc cag ctg gtc	2640
Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val	
865 870 875 880	
atc acc aaa gag ttg acc cgc gca gca gca gac tat gct ggc aag cag	2688
Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln	
885 890 895	
gct cac gtg gag ctg gct gag agg atg agg aag cgc gac ccc ggc agt	2736

200/236

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser	
900 905 910	
gcg ccc agc ctg ggt gac oga gtc ccc tat gtg atc att ggt gct gct	2784
Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala	
915 920 925	
aag ggt gtg gcc gcc tac atg aag tcg gag gac ccc ctg ttt gtg ctg	2832
Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu	
930 935 940	
gag cac agc ctg ccc atc gac act cag tac tac ctg gag cag cag ctg	2880
Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu	
945 950 955 960	
gcc aag ccg ctc ttg cgc atc ttt gag ccc atc ctg ggt gag ggc cgt	2928
Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg	
965 970 975	
gca gag tct gtg ctg ctg cgc ggt gac cac aca cga tgc aag act gtg	2976
Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val	
980 985 990	
ctc acc agc aag gtg ggc ggc ctc ttg gcc ttc acc aag cgc cgc aac	3024
Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn	
995 1000 1005	
tgt tgc att ggc tgc cgc tcc gta atc gac cat caa gga gcc gtg	3069
Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val	
1010 1015 1020	
tgt aag ttc tgt cag cca cgg gag tgg gag ctc tat cag aag gag	3114
Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu	
1025 1030 1035	
gtg tca cac ctg aat gcc ttg gaa gaa cgg ttc tct cgc ctc tgg	3159
Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp	

201/236

1040	1045	1050	
aca cag tgt caa cgc tgc cag ggc agc ttg cat gag gac gtc atc			3204
Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile			
1055	1060	1065	
tgt acc agc cgt gac tgt ccc atc ttc tac atg cgc aag aag gtg			3249
Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val			
1070	1075	1080	
cgc aag gac ctg gaa gac cag gaa cgg ctg ctg cag cgc ttt gga			3294
Arg Lys Asp Leu Glu Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly			
1085	1090	1095	
cgc ccc ggc cct gag gcc tgg tga			3318
Pro Pro Gly Pro Glu Ala Trp			
1100	1105		

<210>	89
<211>	1105
<212>	PRT
<213>	Mus musculus

<400> 89

Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys
1 5 10 15

Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln
20 25 30

Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg
35 40 45

202/236

Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val

50

55

60

Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro

65

70

75

80

Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln

85

90

95

Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly

100

105

110

Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val

115

120

125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro

130

135

140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser

145

150

155

160

Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly

165

170

175

Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser

180

185

190

203/236

Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu
195 200 205

Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu
210 215 220

Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala
225 230 235 240

Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala
245 250 255

Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val
260 265 270

Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val
275 280 285

Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg
290 295 300

Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala

204/236

340

345

350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Ala
385 390 395 400

Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe
405 410 415

Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser
420 425 430

Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser
435 440 445

Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu
450 455 460

His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu
465 470 475 480

Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln
485 490 495

205/236

Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys
500 505 510

Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val
515 520 525

Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu
530 535 540

Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln
545 550 555 560

Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser
565 570 575

Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr
580 585 590

Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile
595 600 605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala
610 615 620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr
625 630 635 640

206/236

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln
645 650 655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu
660 665 670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln
675 680 685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala
690 695 700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly
705 710 715 720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys
725 730 735

Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly
740 745 750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu
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207/236

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Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
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Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
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Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln
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Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
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Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu

208/236

930

935

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Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg
965 970 975

Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val
980 985 990

Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn
995 1000 1005

Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val
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Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu
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Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp
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Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile
1055 1060 1065

Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val
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209/236

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211/236

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cgaaccgcag acgtaccagg aaccgaacca tgtatcaacg ccattgaaga agaagaagaa	240
gaagaaggtg aaaaacgaaa gattgagaat ttgtttgctt tgagcaacca aacctcagga	300
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tcttacagtt aaccgggttt tgtgttttgt tcgattgttc ataaaagaaa gaagactctt	420
gtcgtcgatt agtgccaaag ttgaaagttg aaaccttttc tcagaatttt ctgctcagtt	480
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Met Glu Ile Asp Ser Glu Lys Ile His Glu Arg	
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Lys Gln Ser Asp Tyr Asn Ser Leu	
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agggtttggt atctgattct gagtttttgc aattgaagca g gat gag aga ttc gag	703
Asp Glu Arg Phe Glu	
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ata cag aag gag atg tac aga ggt cag caa tac agt cag att tac ttt	751
Ile Gln Lys Glu Met Tyr Arg Gly Gln Gln Tyr Ser Gln Ile Tyr Phe	
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Ala Arg Leu His Leu Met Arg Thr Leu Leu Tyr Ser Leu Ala Pro Thr	
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212/236

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Trp Lys Ser His Leu Pro	
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Val Cys Lys Val Leu	
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Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr Leu Phe Lys	
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cac atg aag ctt aaa cct tgt gtt ctc gat gaa tat tct aaa gag	1114
His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser Lys Glu	
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Phe Met His Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg	
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Val Lys Leu Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr	
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caaatcttag agattttgat caagctttcc totcttaaaa gatgggttct ttaagaaaat	1440

213/236

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Gly Val Val Val Ala Leu His Gly	
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aag gaa act aat gct ggt gaa ttc ttt gtt gag gat gta cta gaa gct	1539
Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp Val Leu Glu Ala	
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Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu	
165 170 175	
ctatgtttctc ttctttttgc taacctcatg gctcaatcat ttctataagc aatctctcat	1646
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Gln Glu Asp Lys Tyr Val Val Leu Leu	
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Ser Gly Leu Cys Ile Gly Ser Lys Ser Ala Asn Pro Leu Gln Phe Gln	
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Leu Leu Val Asp His Ile Thr Gly His Leu Gly Asp Glu Glu	
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ggtttgaaca g gaa caa ggc ott gca gca cag ata gtt cat gta gta att	1896
Glu Gln Gly Leu Ala Ala Gln Ile Val His Val Val Ile	
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Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile Asn Gly Gln	
230 235 240	

214/236

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Asn Leu Ala Ser Lys Asp

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255

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Ser Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu

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Pro Gln Gln

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Pro Leu Asn Arg

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Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn Thr Phe Arg Ser Cys Thr

295

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aat cct cac tca ttt gat gtc gat aat atc ag gtatgattat tattaatagt 2463

Asn Pro His Ser Phe Asp Val Asp Asn Ile Arg

315

320

215/236

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Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp	
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gac ctt ggc aag tac tca gag got aag agc aag ctt gat ttt gtg gaa	2623
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Gly Cys Tyr Pro Phe	
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acc gat aga gac cct ttc ttg att gaa acc tgc ccg cat gtc tac ttc	2833
Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe	
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Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys	
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Gly Ser Glu Gly Gln Leu Val Arg Leu Ile	
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Cys Ile Pro Lys Phe Cys Glu Thr Gly Ile Ala Val Ala	

216/236

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217/236

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Gln Gln Tyr Ser Gln Ile Tyr Phe Ala Arg Leu His Leu Met Arg Thr

35 40 45

Leu Leu Tyr Ser Leu Ala Pro Thr Trp Lys Ser His Leu Pro Val Cys

50 55 60

Lys Val Leu Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr

65 70 75 80

Leu Phe Lys His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser

85 90 95

Lys Glu Arg Ser Val Thr Pro Leu Val Lys Pro His Asn Phe Met His

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Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg Val Lys Leu

115 120 125

Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr Gly Val Val Val

130 135 140

218/236

Ala Leu His Gly Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp
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Val Leu Glu Ala Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu
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Gln Glu Asp Lys Tyr Val Val Leu Leu Ser Gly Leu Cys Ile Gly Ser
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Lys Ser Ala Asn Pro Leu Gln Phe Gln Leu Leu Val Asp His Ile Thr
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Gly His Leu Gly Asp Glu Glu Glu Gln Gly Leu Ala Ala Gln Ile Val
210 215 220

His Val Val Ile Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile
225 230 235 240

Asn Gly Gln Asn Leu Ala Ser Lys Asp Gln Ser Thr Leu Tyr Glu Pro
245 250 255

Ile Lys Glu Leu Asp Ile Met Leu Ser Gln Ile Ala Ala Gly Val Ser
260 265 270

Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu Pro
275 280 285

219/236

Gln Gln Pro Leu Asn Arg Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn
290 295 300

Thr Phe Arg Ser Cys Thr Asn Pro His Ser Phe Asp Val Asp Asn Ile
305 310 315 320

Arg Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp Asp Leu Gly Lys Tyr
325 330 335

Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu Arg Thr Leu Arg Trp
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cgaaccgcag acgtaccagg aaccgaacca tgtatcaacg ccattgaaga agaagaagaa 240

222/236

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Lys Gln Ser Asp Tyr Asn Ser Leu							
			15				
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					Asp Glu Arg Phe Glu		
					20		
ata cag aag gag atg tac aga ggt cag caa tac agt cag att tac ttt							751
Ile Gln Lys Glu Met Tyr Arg Gly Gln Gln Tyr Ser Gln Ile Tyr Phe							
25 30 35 40							
gct cgt ctt cat ctc atg aga aca ctt ctc tac tct ctt gct cct act							799
Ala Arg Leu His Leu Met Arg Thr Leu Leu Tyr Ser Leu Ala Pro Thr							
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Trp Lys Ser His Leu Pro							
			60				
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223/236

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65	
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Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr Leu Phe Lys	
70 75 80	
cac atg aag ctt aaa cct tgt gtt ctc gat gaa tat tct aaa gag	1114
His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser Lys Glu	
85 90 95	
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Arg Ser Val Thr Pro Leu Val Lys Pro His Asn	
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Phe Met His Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg	
110 115 120 125	
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224/236

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Leu Leu Val Asp His Ile Thr Gly His Leu Gly Asp Glu Glu	
205 210 215	
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ggtttgaaca g gaa caa ggc ctt gca gca cag ata gtt cat gta gta att	1896
Glu Gln Gly Leu Ala Ala Gln Ile Val His Val Val Ile	
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Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile Asn Gly Gln	
230 235 240	
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Asn Leu Ala Ser Lys Asp	
245	

225/236

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Gln

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Ile Ala Ala Gly Val
270

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Ser Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu
275 280 285

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Pro Gln Gln
290

gtatcgataa ctctgattca taggcccttc tcttttggtc ag cct ctg aat aga 2363
Pro Leu Asn Arg

tgt ctt ttc cct gga tot tca cct tat aac acc ttc aga tca tgt aca 2411
Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn Thr Phe Arg Ser Cys Thr
295 300 305 310

aat cct cac tca ttt gct gtc gat aat atc ag gtatgattat tattaatagt 2463
Asn Pro His Ser Phe Ala Val Asp Asn Ile Arg
315 320

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Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp
325 330

226/236

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Asp Leu Gly Lys Tyr Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu	
335 340 345	
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cctttgagtt ctatttggtt ttgattcaact tgcgtacag gt tgt tat cct ttc	2785
Gly Cys Tyr Pro Phe	
365	
acc gat aga gac cct ttc ttg att gaa acc tgc ccg cat gtc tac ttc	2833
Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe	
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Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys	
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Gly Ser Glu Gly Gln Leu Val Arg Leu Ile	
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tgc att cct aag ttc tgt gag acc ggt att gct gtt gcg gtgagtttaa	3042
Cys Ile Pro Lys Phe Cys Glu Thr Gly Ile Ala Val Ala	
410 415 420	
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caccatgtct atttcgcag gtg aac cta aga aat ctg gaa tgt cac act tta	3154
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227/236

425

430

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228/236

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Gln Gln Tyr Ser Gln Ile Tyr Phe Ala Arg Leu His Leu Met Arg Thr
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Leu Leu Tyr Ser Leu Ala Pro Thr Trp Lys Ser His Leu Pro Val Cys
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Lys Val Leu Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr
65 70 75 80

Leu Phe Lys His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser
85 90 95

Lys Glu Arg Ser Val Thr Pro Leu Val Lys Pro His Asn Phe Met His
100 105 110

Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg Val Lys Leu
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130 135 140

Ala Leu His Gly Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp
145 150 155 160

Val Leu Glu Ala Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu

229/236

165

170

175

Gln Glu Asp Lys Tyr Val Val Leu Leu Ser Gly Leu Cys Ile Gly Ser
180 185 190

Lys Ser Ala Asn Pro Leu Gln Phe Gln Leu Leu Val Asp His Ile Thr
195 200 205

Gly His Leu Gly Asp Glu Glu Glu Gln Gly Leu Ala Ala Gln Ile Val
210 215 220

His Val Val Ile Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile
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Asn Gly Gln Asn Leu Ala Ser Lys Asp Gln Ser Thr Leu Tyr Glu Pro
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Ile Lys Glu Leu Asp Ile Met Leu Ser Gln Ile Ala Ala Gly Val Ser
260 265 270

Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu Pro
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Gln Gln Pro Leu Asn Arg Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn
290 295 300

Thr Phe Arg Ser Cys Thr Asn Pro His Ser Phe Ala Val Asp Asn Ile
305 310 315 320

230/236

Arg Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp Asp Leu Gly Lys Tyr
325 330 335

Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu Arg Thr Leu Arg Trp
340 345 350

Arg His Leu Ala Pro Thr Ala Pro Asn Thr Leu Gly Cys Tyr Pro Phe
355 360 365

Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe
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Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys Gly Ser Glu
385 390 395 400

Gly Gln Leu Val Arg Leu Ile Cys Ile Pro Lys Phe Cys Glu Thr Gly
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231/236

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232/236

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233/236

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234/236

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235/236

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236/236

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